PB89-203954

State Activities to Protect Ground Water from Pesticides. Survey Report

Virginia Univ., Charlottesville

Prepared for:

Environmental Protection Agency, Washington, DC

Aug 88

U.S. Department of Commerce
National Technical Information Service
NTIS

50272 - 101

REPORT DOCUMENTATION PAGE

1. REPORT NO.
600/9-89/053

2.

3. Recipient's Accession
PB89 203954/AS

4. Title and Subtitle
Survey Report: State Activities to Protect Ground Water From Pesticides

5. Report Date
Completed Fall 1988

6.

7. Author(s)
Steve Ainsworth, Graduate Student

8. Performing Organization Rept. No.

9. Performing Organization Name and Address

Division of Urban and Environmental Planning
University of Virginia
Charlottsville, VA 22903

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G) U-912-753-01-0

12. Sponsoring Organization Name and Address
U. S. Environmental Protection Agency
Office of Cooperative Environmental Management
499 South Capitol Street, SW   A101-F6
Washington, DC 20460

13. Type of Report & Period Covered
Technical Report

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

This report is part of the National Network for Environmental Management Studies conducted under the auspices of the Office of Cooperative Environmental Management - U. S. Environmental Protection Agency. It presents the results of a survey, conducted in the summer of 1988, to determine what states are doing to protect ground water from pollution by pesticides. The report also highlights a variety of methods used by the states to finance their programs.

Major components of state activities to protect ground water may include: 1) an official ground water protection strategy; 2) a pesticide management plan; 3) ground water monitoring for pesticides; 4) regulatory programs; 5) ground water classification; 6) pesticide user education; and 7) integrated pest management. State monitoring for pesticides in ground water ranges from extensive ongoing programs to limited sampling in response to complaints or suspected problems. Regulatory programs include: ground water quality standards for pesticides; the use of maximum containment levels (MCLs) to protect current or potential drinking water sources; requirements for specific control devices; regulation of distribution, sale, handling, storage, disposal and use of pesticides. Non-regulatory programs play a major role in many states' efforts to protect their ground water from pesticides by : conducting seminars and voluntary training sessions for users of pesticides; developing integrated data systems; and integrating pest management and well head protection. A few states are working toward developing the capacity to overlay ground water vulnerability information with pesticide usage data in order to pinpoint potential ground water contamination problems. The survey report will be used by EPA Headquarters and Regional personnel to prepare for presentations before states and their audiences. Kept in a looseleaf folder, the summaries can be separately revised as new information becomes available.

17. Docuement Analysis a. Docuement Discriptors

b. Identifier's/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement

19. Security Class (This Report)
Unclassified

20. Security Class (This Page)
Unclassified

21. No. of Pages

22. Price

(See ANSI-Z39.18)

OPTIMAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

PB89-203954

Final
4/03-88

SURVEY REPORT

STATE ACTIVITIES TO PROTECT GROUND WATER FROM PESTICIDES

Steve Ainsworth
University of Virginia
NNEPS Fellow
EPA Office of Pesticide Programs

August 1988

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VA. 22161

ACKNOWLEDGEMENTS

This report is the product of a fellowship sponsored by the U.S. Environmental Protection Agency's {EPA} National Network for Environmental Policy Studies program. The fellow was Steve Ainsworth of the University of Virginia; Mr. Ainsworth conducted the survey and wrote the draft report. Valuable assistance was provided by the Pesticides and Ground Water offices of the ten EPA Regions, as well as by state officials who participated in telephone interviews and reviewed the information for accuracy and completeness. The final report will be compiled by the sponsoring office, the Office of Pesticide Programs {OPP}. Special thanks go to the staff of OPP and to Bob Barles, the project sponsor, who is now with the Office of Ground-Water Protection.

Disclaimer

This report was furnished to the U.S. Environmental Protection Agency by the graduate student identified on the cover page, under a National Network of Environmental Policy Studies fellowship.

The contents are essentially as received from the author. The opinions, findings, and conclusions expressed are those of the author and not necessarily those of the Environmental Protection Agency. Mention, if any, of company, process, or product names is not to be considered as an endorsement by the U.S. Environmental Protection Agency.

CONTENTS

PAGE

INTRODUCTION

Region I

- Connecticut
- Maine
- Massachusetts
- New Hampshire
- Rhode Island
- Vermont

Region II

- New Jersey
- New York
- Puerto Rico
- Virgin Islands

Region III

- Delaware
- Maryland
- Pennsylvania
- Virginia
- West Virginia

Region IV

- Alabama
- Florida
- Georgia
- Kentucky
- Mississippi
- North Carolina
- South Carolina
- Tennessee

Region V

- Illinois
- Indiana
- Michigan
- Minnesota
- Ohio
- Wisconsin

Region VI

Arkansas
Louisiana
New Mexico
Oklahoma
Texas

Region VII

Iowa
Kansas
Missouri
Nebraska

Region VIII

Colorado
Montana
North Dakota
South Dakota
Utah
Wyoming

Region IX

Arizona
California
Hawaii
Nevada

Region X

Alaska
Idaho
Oregon
Washington

EXECUTIVE SUMMARY

This report presents the results of a survey sponsored by the Environmental Protection Agency's (EPA) Office of Pesticide Programs. The purpose of the survey, conducted in the summer of 1988, was to determine what states are doing to protect ground water from pollution by pesticides.

Major components of state activities to protect ground water may include an official ground water protection strategy, a pesticide management plan, ground water monitoring for pesticides, regulatory programs, ground water classification, pesticide user education and integrated pest management.

State monitoring for pesticides in ground water ranges from extensive ongoing programs to limited sampling in response to complaints or suspected problems. Regulatory programs include: ground water quality standards for pesticides; the use of maximum containment levels (MCLs) to protect current or potential drinking water sources; requirements for specific control devices such as anti-backsiphoning devices on chemigation equipment, and; regulation of the distribution, sale, handling, storage, disposal and use of pesticides. In some states, agriculture is exempt from ground water protection regulations, although agrichemical production, storage and disposal facilities may not be.

Non-regulatory programs play a major role in many states' efforts to protect their ground water from pesticides. Some of the important non-regulatory activities that contribute to these efforts are conducting seminars and voluntary training sessions for users of pesticides, developing integrated data systems, integrated pest management and wellhead protection programs.

A few states are working toward developing the capacity to overlay ground water vulnerability information with pesticide usage data in order to pinpoint potential ground water contamination problems. They will be able to use this information to help target sites for monitoring and as an aid in deciding whether a regulatory or non-regulatory response is needed.

States pay for their programs in a variety of ways. They charge fees for registration and reregistration, certification, and licensing; the revenue collected pays administrative costs and, in some states, is deposited into a fund and used to defray monitoring costs or to help pay for cleaning up spills or for providing alternative drinking water supplies. Such a fund may also support research, implementation of IPM and public education programs.

The survey report will be used by EPA headquarters and regional personnel to prepare for presentations before state and other audiences. Kept in a looseleaf folder, the summaries can be separately revised as new information becomes available. The Agency will send copies of the folder to interested states.

INTRODUCTION

The Environmental Protection Agency's {EPA} Office of Pesticide Programs {OPP} sponsored a survey this summer {1988} to determine what states are doing to protect ground water from pesticide contamination. This report presents the results of the survey.

State officials were asked to provide information for and review summaries of state pesticide control activities as these relate to ground water protection. Although the primary interest of the Office was to obtain information on preventative actions, state remedial efforts or programs were also reported. The information obtained from telephone interviews of state officials was supplemented with that gleaned from reports and other state and federal governmental materials. The surveyor contacted an official in each state that deals with pesticide use, usually an agricultural agency or subagency, and an official with a ground water protection office, environmental protection or health agency.

The focus of the survey was ground water protection from pesticides, yet since surface water may in some areas recharge ground water, information on state activities to control surface water contamination from agricultural chemicals--such as best management practices--is sometimes provided.

The survey report will be used by EPA headquarters and regional personnel to prepare for presentations before state and other audiences. Kept in a looseleaf folder, the summaries can be separately revised as new information becomes available. The Agency will send copies of the folder to states interested in the pesticide control activities of other states.

The quality and quantity of information in a summary varies from state to state in accordance with the scope of a state's pesticide control activities and the completeness of a state's response to survey questions. A brief summary does not necessarily indicate a failure to adequately address the issue; it may reflect that a state simply does not have a problem with pesticide contamination of ground water, or that state officials under-reported their state's pesticide control activities.

The format of the summaries is designed to highlight the major components of state activities to protect ground water from pesticide contamination. An introductory section typically establishes whether a state has a ground water protection strategy {virtually all do}, identifies its general goal, and points out whether the strategy includes a pesticide management plan. Some states incorporate a pesticide management plan in their strategies, while others have developed or are developing a separate plan. Many are coordinating these separate plans with ground water protection strategy recommendations.

A summary's introduction is followed by sections on the state's ground water monitoring for pesticides efforts, its regulatory programs, and other pesticide control related activities, such as user education, integrated pest management, and best management practices programs.

State monitoring for pesticides in ground water ranges from extensive ongoing programs to limited sampling in response to complaints or suspected problems. The extent of a state's monitoring activities depends on the vulnerability of its ground water to pesticide contamination, the level and scope of pesticide usage, the characteristics of the pesticides used, the perceived seriousness of the problem {if one exists}, and the capacity of the state to pay for monitoring.

Virtually all states have regulations that deal with some aspect of pesticide control. Many have ground water quality standards for pesticides, either numeric or narrative, or both. In most cases, states with numeric standards have adopted the federal drinking water standards for six pesticides: 2,4-D, endrin, lindane, methoxychlor, toxaphene, and 2,4,5-TP silvex. Some states have adopted or are promulgating standards for additional pesticides, and some of these have developed more stringent standards than those suggested by EPA. Depending on the circumstances, detections of pesticides in ground water at or below standards may trigger either remedial, regulatory, or non-regulatory responses.

Most states have classified or are in the process of classifying their ground water into categories based on use, value, or vulnerability to contamination. Many apply differential protection to the various classes, ranging from maximum protection of high priority drinking water to allowing waste injection in ground water high in total dissolved solids. Many of these states will rely on maximum contaminant levels {MCLs} to protect current or potential drinking water sources. Some states, however, favor viewing all or most of their ground water as "current or potential" drinking water and treating it all the same. Several have established a nondegradation policy for current or potential drinking water and ground water of special ecological value. They will use more stringent standards than MCLs to protect these ground waters from pesticides and other contaminants.

In some cases, states have specific legal authority for regulatory programs to protect ground water from pesticides. This may consist of provisions within rather broad ground water protection legislation or laws that address specific activities, such as statutes that require anti-backsiphoning devices on chemigation equipment. In many states, agriculture is exempt from ground water protection regulations, although agrichemical production, storage, and disposal facilities may not be.

States which do not have specific ground water protection legislation that regulates pesticides have the option of managing pesticide use through pesticide control laws--either state statutes or the Federal Insecticide, Fungicide, and Rodenticide Act {FIFRA}. These laws generally authorize state departments of agriculture to regulate the distribution, sale, handling, storage, disposal, and use of pesticides. States register pesticides for use in their states, enforce FIFRA labeling requirements, place restrictions on the use of certain pesticides, require certification and licensing for the use and sale of restricted use pesticides, and often require that applicators and dealers of restricted use pesticides keep usage and sales records, respectively.

Non-regulatory programs play a major role in many states' efforts to protect ground water from pesticide contamination. Indeed, some states favor a non-regulatory over a regulatory approach to the problem. They stress the importance of improving user education through seminars and voluntary training sessions, conducted perhaps by state Cooperative Extension Service personnel. It should be pointed out, however, that other states prefer a regulatory approach to improving user education, by establishing additional educational requirements under certification regulations.

Other important non-regulatory activities that contribute to the protection of ground water from pesticide contamination include integrated pest management {IPM}, the development of integrated data systems, the promotion of best management practices {BMPs}, and wellhead protection. Many states are at least conducting research on IPM, and some are using it on particular crops; a handful have impressive IPM programs which they have used on major and minor crops to reduce the use of certain pesticides significantly.

Protecting ground water resources from degradation by pesticides will require data on location of aquifers, depth to ground water, characteristics of soil overlying ground water, the chemical and physical characteristics of pesticides used in the state, and the level and extent of use of specific pesticides, among other things. This information must be collected, stored, and usable, requiring a data base accessible to all agencies in a state with ground water protection responsibilities. A few states are working toward developing the capacity to overlay ground water vulnerability information with pesticide usage data to locate potential ground water contamination problems. They can use this information to help target sites for monitoring or as an aid in deciding whether a regulatory or non-regulatory response is needed.

Although states are promoting BMPs to protect primarily surface water from pollution by agricultural chemicals, since there may be some interchange of surface and ground waters at certain locations, BMPs may also be used to protect ground water in those areas. Certain BMPs such as "no-till" or reduced tillage, though, may actually contribute to ground water contamination when large amounts of herbicides are applied to kill weeds formerly controlled through conventional tillage. Further study is needed on the impact of particular BMPs on ground water quality.

Most states have at least shown an interest in developing wellhead protection programs. Some have implemented them in certain areas, while others are conducting wellhead protection pilot projects. Progress in many states has been slowed by funding difficulties.

Funding is an ascendant issue for states in developing programs for protecting ground water from pesticide contamination. They pay for their programs in a variety of ways. States charge fees for registration and reregistration, certification, and licensing; the revenue collected pays administrative costs and, in some states, is deposited into a fund and used to defray monitoring costs or to help pay for cleaning up spills or providing alternative drinking water supplies. Such a fund may also support research, implementation of IPM, and public education programs.

In other states manufacturers of pesticides have agreed to pay at least part of the costs of monitoring for their products, or to provide monetary relief to private well owners whose drinking water contains residues of the manufacturers' products above a water quality standard or an interim guideline.

At least one state has passed a clean water bond issue to pay for the provision of public water supplies in areas where unacceptable contamination of private wells has occurred. Some of this money has been allocated to fund a wellhead protection program. Another state has levied a per barrel tax on pesticide products. Many states pay for ground water protection activities out of general revenue funds, appropriated--more or less reliably--by their legislatures. Finally, federal grants have also been used by states to fund pesticide control activities.

Region I

Connecticut

Maine

Massachusetts

New Hampshire

Rhode Island

Vermont

STATE PESTICIDE CONTROL ACTIVITIES: CONNECTICUT

The state's ground-water protection strategy is under revision and is scheduled for completion by the end of FY 1988. The present strategy utilizes a ground water classification system integrated with water quality standards, land use controls, and discharge permits. It may be characterized as differential protection applied to four classes of ground water--from municipal drinking water supplies to areas where ground water is not intended to provide a future supply of drinking water. The basic goal of the program is to restore or maintain the quality of ground water to a level that permits drinking without treatment.

Monitoring Program Review

The Connecticut Agricultural Experiment Station conducted a year-long study which analyzed 42 community water supply wells for 32 compounds, including EDB. No pesticides were detected in any of the samples.

A cooperative pesticides sampling program is underway by the U.S. Geological Survey, the Connecticut Department of Environmental Protection {DEP}, and the state Agricultural Experiment Station. The three year study began in 1987 to sample ground water in stratified drift and bedrock aquifers which underlie agricultural fields. Through this study the state hopes to determine the extent of contamination, if any, from agricultural chemicals.

Surface water supplies are monitored every three years for regulated pesticides; ground water is generally monitored when a problem is suspected. Alachlor, 1,2-D, 1,3-D, 2,4-D, metolachlor, simazine, and low amounts of dicamba have been detected in ground water.

Regulatory Programs

Connecticut has narrative ground water quality standards, which it applies in combination with its classification system to protect ground water. The narrative standards state that ground water is to be free of chemical constituents in concentrations or combinations that would be harmful to the assigned class; they describe the beneficial use of each class and the types of discharges that would be allowed. Criteria for drinking water quality, including federal advisories and local standards, are taken into consideration. The standards may apply to both point and nonpoint sources, including pesticides.

The DEP requires registration for any pesticide used, sold, or distributed in the state. The Department may reclassify general use pesticides to a restricted use category, thereby requiring a permit for their use. The Department may prescribe fees for registration as well as fees to register persons who distribute or sell restricted or permit use pesticides. Collected fees are deposited in the emergency spill response fund. The fund also includes certification fees and fees for golf course applications. Private applicators--primarily farmers--must maintain records of restricted pesticide use.

DEP also has the authority to develop a registration program for commercial applicators. The Department requires that commercial applicators apply for a registration certificate and sets standards by which applications will be considered.

Connecticut has refused state registration of the soil fumigant, Vorlex, with formulations containing 1,2-D.

The DEP conducts pesticide misuse investigations and enforcement. In the past, farmers were liable for any damages due to their application of chemicals, even if they had applied them in accordance with the label. The state ordered farmers to supply drinking water to more than 800 households; the vast majority of these had wells contaminated with EDB. The state supplied drinking water until the order could be complied with. Public Act 88-211, however, passed in 1988, limits farmer liability--provided that the farmer applied the pesticide correctly and kept the required records.

Where no liable party can be identified, the state will supply short-term drinking water and pay the entire cost of the engineering report {50% for private water companies} to develop a long-term solution. The state will also provide grants for the construction of capital improvements needed for the most cost-effective long-term solution. Municipalities may be advanced up to 100% of the short- or long-term cost.

Special Act 86-84 authorized a statewide assessment of pesticide usage in the state and of special ground water problems. The U.S. Geological Survey will assist by sampling wells in areas with high potential for pesticide contamination. The final report is due in 1990.

Other Activities

Connecticut has an extensive data base on the hydrogeological conditions of the state. In cooperation with USGS, DEP has collected information on all watersheds, the properties and distribution of aquifers, depth to water tables, water quality in vulnerable or sensitive areas, locations of public water supply wells, locations of pollution sources, and so on.

The state has an active public education and involvement program, with direct assistance to local planning and conservation commissions in land and water use activities. The state Cooperative Extension Service gives advice and assistance to farmers on the correct application, handling, and disposal of pesticides.

The College of Natural Resources of the University of Connecticut conducts research on pesticide usage issues and on integrated pest management, while the state Agricultural Experiment Stations do research on the fate of pesticides in the environment.

STATE PESTICIDE CONTROL ACTIVITIES: MAINE

Maine, through a Ground Water Standing Committee, is drafting a ground water protection strategy, scheduled for completion in the summer of 1988. The state classifies ground water according to current or potential need for drinking water and uses a differential protective approach based on relative use and value of ground water. Its primary goal will be to prevent unacceptable contamination of current and potential drinking water. Maine favors setting a goal of nondegradation for certain high priority ground waters, such as ground water which supplies rural residents with their drinking water.

Monitoring Program Review

The State has analyzed all Public Water Systems at least twice for regulated pesticides and none were detected.

Since 1980 Maine has cooperated with Rhone-Poulenc {formerly Union Carbide} to monitor ground water for aldicarb in potato growing areas. A high of 262 samples were taken in the early years but the number of wells has been dramatically reduced as the residues have declined. The latest monitoring of 48 wells in 1987 revealed a high of 15 ppb which is much lower than the 77 ppb detected in a well in 1983.

In 1985, the state began a three year evaluation of agricultural practices on ground water quality. In the first two years, samples were collected from 59 overburden and 26 bedrock wells in areas of extensive potato, blueberry, market crop, and apple production. Of 188 samples, only one contained pesticide {dinoseb} concentrations above an established health standard, and only three exceeded statistically sound levels of detection. Trace amounts of hexazinone were detected in two samples in blueberry growing areas. One sample from forage crop/market garden areas gave postive results for atrazine, another for alachlor. In the potato growing areas of northern and western Maine, 27 of 148 samples had detectable levels of several pesticides: methamidophos, metribuzine, dinoseb, endosulfan, chlorothalonil, dicamba, and picloram.

The Maine Geological Survey tested 9 wells for ETU {a product of EBDC fungicides} in Jan. 1988 and the results were positive. The results in Feb. 1988, however, were negative. The State does not know whether ETU degraded naturally during that time, or whether the analytical method produced false positives. Additional testing will be conducted during 1988 to check these possibilities.

Regulatory Programs

Maine has numeric ground water quality standards for 2,4-D, endrin, lindane, methoxychlor, toxaphene, and 2,4,5-TP silvex.

These standards are set at the same levels as the federal drinking water standards; Maine wants the freedom to set lower levels for certain high priority ground waters.

The Maine Pesticide Control Act of 1975 is the primary state legislative authority to regulate the labeling, distribution, storage, transportation, use and disposal of pesticides. The Board of Pesticide Control within the Department of Agriculture (DOA) registers pesticides for an annual fee of $70 ($60 for pesticides of less than $6000 annual retail sales). Fees are deposited in the Pesticide Control Fund to cover operating costs of the Board and DOA's IPM program. Ten dollars of the fee funds research and evaluation of pesticide-related public health concerns. The Board may refuse or cancel the registration of a pesticide, place restrictions on its use, or suspend its use if it poses an imminent hazard.

The Board conducts misuse investigations and enforcement. It may stop the sale or use of a pesticide it suspects is being distributed, stored, or used illegally. Furthermore, the Board may deny or revoke any license, registration, or permit, subject to a hearing, in cases of noncompliance. Violators can be fined a maximum of $500 for a first violation, $1000 for subsequent ones.

Commercial applicators and spray contracting firms must be certified and licensed. Certification is also required of private applicators of restricted use pesticides. Pesticide dealers must secure a distribution license. Applicants for certification or licenses must demonstrate adequate knowledge of pesticide use or distribution and pay annual fees. The state is adding training in ground water protection to its certification program.

Any person making outdoor applications with powered equipment and all commercial applicators must maintain records of pesticide use for at least two years, while dealers maintain records of pesticide distribution. The requirement for commercial applicators to have chemical/ pollution liability insurance has been waived until March 1, 1989, as this type of coverage is not yet reasonably available. Licensed applicators who cannot obtain this insurance insurance are required to provide written disclosure of this fact to customers.

The Pesticide Control Board has the authority to designate critical areas where pesticide use would threaten endangered species or critical wildlife habitat, would present an unreasonable threat to quality of the water supply, would undermine a state or federal master plan for the area, or would otherwise result in unreasonable adverse effects on the environment of the area.

The state has a returnable pesticide container program that requires dealers to affix an identifying sticker to each container of a liquid restricted use pesticide upon sale, and that purchasers leave a deposit of an amount sufficient to promote their return. Returners of properly rinsed containers get their deposit refunded. Returnable containers are inspected for pesticide residues, crushed, and disposed of; inspectors rejected only 1% of the containers in 1987.

Maine has new drift regulations which set minimum standards of conduct for applicators (e.g., recognition of wind speed and direction, equipment functioning, label instructions, presence of humans or animals, etc.). They also require identification of sensitive areas (homes, schools, designated critical areas, developed recreation facilities, public and private drinking water sources, etc.) before spraying can commence.

The state is frequently more restrictive than EPA and its long restricted use list demonstrates this fact. In addition, Maine classifies a few products as limited use pesticides and requires a permit for their application. Lindane and trichlorfon are examples where use is allowed only when there are specific pest problems that cannot be controlled by other available pesticides.

Other Activities

The State has a position funded for an Integrated Pest Management specialist in the Dept. of Agriculture. Agency personnel want to go to the legislature and seek money for research in sustainable agriculture.

Maine has collaborated with the Extension Service, the Soil Conservation Service, and farmers on a best management practices (BMP) manual, to be distributed in the fall of 1988. The state's BMP program is a significant part of its pesticide management strategy. It advises farmers on the characteristics of pesticides and offers some practical tips on protecting ground water.

The state has at least two intra-state committees working on pesticide/ground water issues. It is considering furthering coordination among agencies through memos of agreement which spell out the responsibilities of each agency in ground water protection.

STATE PESTICIDE CONTROL: MASSACHUSETTS

An interagency task force is currently convening to develop a comprehensive state ground water protection strategy, with an understanding with the state Pesticide Bureau to examine pesticide practices in the state. The state will implement a ground water classification system and will place a greater emphasis on land use planning, aquifer protection plans, and management of pesticide use to protect its ground water. The overall goal of the strategy is to protect the ground water resources by preventing unacceptable contamination of current or potential sources of drinking water. The state will use health-based guidelines, MCLs, or other criteria in assessing unacceptable contamination.

The pesticide element of the strategy will focus on determining the potential for ground water contamination in areas of concern from individual pesticides, assess the health hazards and magnitude of potential contamination, and propose an appropriate control to mitigate the problem.

Monitoring Program Review

In 1985, an interagency task force was formed to carry out a ground water monitoring program for the following pesticides: aldicarb, alachlor, carbofuran, 1,2-D, 1,3-D, dinoseb, EDB, and oxamyl. In conjuction with this program, the state developed interim drinking water guidelines for these pesticides. The task force selected sample sites near areas of known or expected use of the pesticides. A total of 341 ground water sources in 27 communities were tested for at least one pesticide. About 86% of the sites were private wells, and nearly half of all the sources were in the Town of Whately.

None of the 48 public water supplies tested had levels for any pesticide above the interim guidelines. The three pesticides detected most often were 1,2-D {no longer used in the state}, EDB {cancelled in 1984}, and aldicarb. Eighty-two of 239 sources had detectable levels of 1,2-D, with 31 of the 82 above the interim guidelines. Twenty-five of 239 sources tested for EDB and 20 of 146 sources tested for aldicarb were above the guidelines.

1,3-D was not found in any sample, while oxamyl was detected in one sample only--well below the guideline. Alachlor appeared in 5 of 147 samples with only one above the guideline. Dinoseb was found in 10 of 147 samples with two above the guideline. Finally, carbofuran was detected in 23 of 146 samples, with only one sample above guideline.

In 1987, private drinking water wells in vulnerable areas near cornfields were tested for alachlor, atrazine, and metolachlor. Sixty-five samples were collected from 50 wells. In 1988, 50 to 75 additional wells will be sampled twice for the three pesticides.

Regulatory Programs

Massachusetts has both numeric and narrative ground water quality standards. It has adopted the federal drinking water numeric standards for 2,4-D, endrin, lindane, methoxychlor, toxaphene, and 2,4,5-TP silvex.

Narrative standards apply minimum criteria to class I and class II ground water. Class I ground water is that designated as a source of potable water supply; class II as a source of potable mineral water, for conversion to fresh potable water, or as raw material for the manufacture of sodium chloride or its derivatives. The minimum criteria, as they relate to pesticides, are that no pollutant is to be present in concentrations that would impair the water for use as a source of potable water or cause or contribute to a condition contravening the standards for other classified water of the state.

The state Pesticide Control Act, passed in 1988, established the Pesticide Control Board within the Department of Food and Agriculture. A subcommittee of the board registers pesticides in the state. The subcommittee may revoke the registration of a pesticide, or may suspend its use temporarily when continued use poses an imminent health hazard. It requires certification for applicators of limited use pesticides. The subcommittee may also identify sensitive areas and require permits for application of certain limited use pesticides. Moreover, it designates restricted use pesticides and limits their use to certified applicators. Finally, it has the authority to manage the use of pesticides through label changes.

In 1986, the subcommittee amended the registration of the following pesticides to restricted use because of their ability to leach to ground water: alachlor, atrazine, bromacil, carbofuran, cyanazine, dacthal, metolachlor, metrabuzin, oxamyl, and simazine. The registration of aldicarb, a limited use pesticide, will be reviewed in 1988.

The state Department of Food and Agriculture {DFA} requires that all commercial applicators keep pesticide use records and licensed dealers maintain restricted use pesticide sales records. Restricted use pesticide distribution data has been collected annually since 1985. Since 1985, all licensed and certified applicators--including farmers--must keep pesticide use records. The only significant use that remains untabulated is homeowner use, and regulations may eventually be promulgated to address this use.

Under its proposed Rights of Way Management Regulations, the state will establish buffer zones surrounding sensitive ground water areas and restrict the use of certain pesticides within these areas.

The Protection of Public Water Supplies regulation, proposed in 1988, will prohibit the use of pesticides which pose risks through ground water contamination from public water supply areas.

DFA is training farmers in the proper disposal of pesticide wastes. It will develop regulations to minimize the accumulation of wastes and to prevent the risk to ground water contamination from improper pesticide storage, mixing, and loading.

Other Activities

Massachusetts is spending about $450,000 for fiscal year 1988 on the development of IPM and biological controls, targeting crops near high-vulnerability ground water systems. IPM programs in the state have been shown to reduce pesticide use by 10 to 45% {depending on the crop} without a decrease in yields. In addition, the state is conducting experiments in biological pest control because of the restrictions it has placed on aldicarb.

Applicator training workshops on ground water protection issues are held each year through the Cooperative Extension Service. The DFA is also amending its pesticide examinations to address, in addition to ground water concerns, changes in pesticide registration and regulations.

Through the interagency task force, the manufacturers of the eight pesticides monitored by the task force agreed to provide relief to private well owners whose wells contain residues of their products above the interim guidelines. The well owner would have the option of installation of a home filter system or up to $1000 to connect to a public water system.

In 1987, the DFA obtained Pesticide Root Zone Model, which it hopes to use--pending additional funds--to predict the ability of pesticides to leach to ground water. It has begun to enter state weather, soil, and other data into the system. In addition, DFA is developing a database on all agricultural lands in the state and will phase in pesticide use information.

Finally, a wellhead protection pilot project is due for release this year.

STATE PESTICIDE CONTROL ACTIVITIES: NEW HAMPSHIRE

The State Division of Pesticide Control, Department of Agriculture is developing a management plan for pesticides in ground water to ensure that contamination will not occur in the future. The Department of Environmental Services is completing work on a draft ground-water protection strategy, due for completion in September 1988. The state's narrative ground water quality standards reflect a concern with integrating surface and ground water protection efforts.

Monitoring Program Review

The state Department of Environmental Services, the Division of Public Health Services and the Division of Pesticide Control have sampled ground water in high pesticide use areas. Beginning with areas abutting apple orchards, samples were taken in 1985 and analyzed for 17 pesticides. This survey was expanded in 1986 to examine sites near intensive vegetable-growing areas, forage growing areas, and golf courses. The analysis showed no detections of pesticides. The State suspects that there may be a small problem with pesticides leaching into ground water through applications to lawns and subsequent overwatering.

New Hampshire is not aware of a problem with pesticide contamination of surface water. The State is concerned, however, with pesticides used on corn near rivers. It is considering testing the surface water near some of these cornfields for the presence of pesticides.

Regulatory Programs

New Hampshire has both numeric and narrative ground water quality standards. The state uses the federal drinking water standards for 2,4-D, endrin, lindane, methoxychlor, toxaphene, and 2,4,5-TP silvex.

The narrative standards prohibit polluting ground water with any substance at a level that the Department of Environmental Services determines may harm human health or the environment, including but not limited to MCLs as identified by federal drinking water standards. They further prohibit degradation of ground water beyond one's own property and degradation of ground water that results in a violation of surface water quality standards in any surface water body within or adjacent to one's own property.

The State has a Pesticide Control Board which regulates the time, place, and conditions for pesticide use; restricts or prohibits the application of certain pesticides; regulates the handling, transport, and disposal of pesticides; and sets container labeling requirements.

State law requires permits from the Division of Pesticide Control in the Department of Agriculture for commercial application of all pesticides and private application of restricted use pesticides. The Division mandates licensing for pesticide dealers and registration for all pesticides sold in the State. Domestic users of pesticides are partially exempt from these provisions provided that they do not allow pesticides to enter a body of water as a result of their application.

All pesticide applicators are required to submit pesticide use records annually. Maine has mapped all pesticide use sites and entered this information into a computer. The use data is also stored in a computer and is correlated to the map sites. This information is used to inform ground water protection efforts and in making regulatory decisions.

Other Activites

New Hampshire is presently considering a proposal to establish a ground water classification system, which could be enacted by the legislature by the end of calendar year 1989.

The state is expecting to complete a pilot wellhead protection project by the end of calendar year 1988.

STATE PESTICIDE CONTROL ACTIVITIES: RHODE ISLAND

The state Department of Environmental Management, Ground-Water Section, is revising its ground-water protection strategy, with completion expected during the second quarter of 1988. The state will employ ground water classification with a differential approach to ground water protection.

Monitoring Program Review

Rhode Island monitors its Public Water Systems {PWSs} annually, surface and ground, for the regulated pesticides. Nearly all PWSs and all private wells within 1/2-mile radius of about 130 potato fields were sampled for aldicarb. Approximately two PWSs and 15 private wells tested positive.

The Department of Environmental Management {DEM} is conducting a private well survey, sampling approximately 500 wells for ground water impacts from eight categories of land use including three--agriculture, turf farming, and silviculture and nursery operations--that deal with pesticide impacts. The Department expects completion of the sampling by October 1988.

Regulatory Programs

The Director of DEM was required by state law to develop water quality standards containing maximum contaminant levels for each classification of aquifers: {1} Class GAA--suitable for public drinking water without treatment; {2} Class GA--may be suitable for public or private drinking water without treatment; {3} Class GB--may not be suitable for public or private drinking water without treatment because of pollution; and {4} Class GC--may be suitable for waste disposal because of pollution. The classification system has been developed, though not yet implemented.

Moreover, the Director was required to establish preventive action limits {PALs} for contaminants found in ground water. A PAL is a "specified percentage of a maximum contaminant level."

Rhode Island requires well set-backs near public water supplies. It also requires permits for pesticide usage near surface water. An applicator needs the permission of the Director of the DEM in order to use pesticides in a watershed.

The state also collects annual pesticide registration fees for its Pesticide Relief Fund. The fund is used for: {1} emergency relief for pesticide contamination; and {2} financial support for low-input pest control methods, particularly integrated pest management {IPM}. In addition, the fund can be used for testing and monitoring for pesticides, carbon filters and other treatment devices, bottled water, alternative water supplies, research, and public education.

Because of a lack of appropriate labeling restrictions regarding use, the state did not register aldicarb for the 1985 growing season. Under a Section 18 emergency exemption, potato farmers are using kryocide and other products in lieu of aldicarb.

Other Activities

The Pesticide Relief Advisory Board makes recommendations regarding uses of Pesticide Relief Fund monies and provides advice on pesticides and the health dangers associated with pesticide use. The board consists of 11 members--10 public members and the chairperson of the Joint Committee on the Environment or his/her designee.

The state uses IPM in mosquito abatement programs, in turf farming, on corn, and on fruit trees, and has provided $55,000 in grants for various IPM and non-chemical pest control projects.

Rhode Island is developing an innovative Geograhic Information System. The system stores information on the ground water--including its classification and its vulnerability to pesticide contamination--in the aquifers of the state and pairs this information by computer to the location of farms. Since it also collects pesticide use date on restricted use pesticides, the state potentially will have the capacity to target monitoring, applicator and other training efforts, and enforcement to specific farms.

Finally, the state is developing two wellhead protection pilot projects.

STATE PESTICIDE CONTROL ACTIVITIES: VERMONT

Through a coordinating committee, Vermont is currently reviewing its 1982 ground-water protection strategy. The revised strategy is targeted for completion in early FY 1989. The state will adopt a ground water classification system and will promulgate numeric ground water quality standards as part of a new ground water rule. It favors differential protection relative to quality and quantity of ground water but wants to preserve high quality ground water for the highest and best future uses in anticipation of population growth and unanticipated degradation of existing sources.

Monitoring Program Review

Vermont sampled 260-70 wells in areas of corn production and chemical usage for the five most commonly used pesticides: alachlor, atrazine, simazine, cyanazine, and metolachlor. The results revealed a few detections of atrazine. During 1984 and 1985 the state Health Department tested three sites--a highway guard rail site, a railroad site, and an electric utility right-of-way--for various herbicides and found nothing.

A Pesticide Monitoring Revolving Fund, fed by pesticide registration fees, was established by 1985 legislation to pay for monitoring. The same legislation also required the Commissioner of Agriculture to develop a monitoring plan.

Regulatory Programs

Vermont has narrative ground water quality standards which state that the Secretary of the Agency of Natural Resources may establish technical criteria and standards to manage activities that pose risks to ground water classes. Additionally, they include numeric standards primarily based on EPA drinking water standards and health advisories. In adopting criteria and standards, the Secretary is to consider, among other things, drinking and surface water standards, the nature of any risks to the ground water, cost and effectiveness issues, and the consequences to the public interest of irremediable damage.

Proposed rules based on a 1985 law direct the Secretary of the Agency of Natural Resources to develop a comprehensive ground water protection program which will include: {a} data on on the quality, quantity, and location of aquifers; {b} identification and mapping of present and potential underground public water supplies; {c} classification of aquifers by use; and {d} adoption of criteria and standards to manage activities that may affect such uses.

Aquifers will be classified into four groups: {1} Class I--suitable for public water supply and currently not exposed to any risk; {2} Class II--suitable for public water supply but exposed to some degree of risk; {3} Class III--suitable for individual domestic water supply, irrigation, other agricultural use, industrial and commercial use; and {4} Class IV--not suitable for potable water supply but may be used for agricultural, industrial, and commercial use.

Considerations for classifying an aquifer include its current or potential use, the extent of activities that may affect its classification, its present water quality, and the classification of adjacent surface waters. The state is empowered to prohibit certain activities on land overlying Class I aquifers. Vermont is currently promulgating rules for the implementation of the classification system.

The Pesticide Control Act is the primary state authority for regulating the use of pesticides. The Act established a Pesticide Advisory Council attached to the state Department of Agriculture {VDA}--the lead agency for regulating the use of pesticides. The duties of the Council include: {1} to review pest control programs and assess their effects on human health, water, wildlife, natural resources, and food production, and where appropriate make recommendations for greater safety and efficiency; {2} to advise state agencies responsible for the use of pesticides; {3} to advise the executive branch on legislation on the use of pest control measures; {4} to suggest programs and legislation that lead to reduction in pesticide use while remaining consistent with sound pest management; and {5} to prepare an annual or more frequent list of pesticides which warrant stricter control.

VDA regulates the sale, use, storage, treatment, and disposal of pesticides and pesticide wastes. The Department requires licenses of commercial applicators and pesticide dealers, and certifies commercial and private applicators. All applicators of restricted use pesticides must also be certified.

Private applicators must show a practical knowledge of pest problems and pest control practices, proper storage, use, handling, and disposal of pesticides, and related legal responsibility by passing a written examination.

Permits are required for certain uses, including aerial and right-of-way applications, experimental use, to control bird or animal pests, etc. VDA conducts misuse investigations and enforcement, and may suspend or revoke any license, certificate, or permit for noncompliance.

The Department registers pesticides in the state and may ban or restrict their use. For instance, Vermont prohibits the use of aldicarb within 500' of a private well used for drinking water. Special permits are required for the sale or use of restricted use pesticides such as aldrin, endrin, dieldrin, heptachlor, and DBCP, among others. The use of any pesticide must accord with recommendations on the label.

Vermont has pesticide drift regulations which specify that applicators apply pesticides in a manner that minimizes contamination to non-target land and water areas.

The VDA has developed standards for applicator equipment and for the safe and efficient application of pesticides. In chemigation operations, for example, the operator must use an anti-siphoning device to prevent backflow of pesticides into ground water.

Certified applicators of restricted use pesticides must report the amounts applied to VDA. Certified commercial and non-commercial applicators must report data on any pesticide used, while licensed dealers record the sales of all pesticides. Permit holders also have recordkeeping requirements under the law.

Vermont had detailed regulations on the storage and disposal of pesticides, including requirements for catch basins at loading docks, secondary containment for liquid bulk pesticides, triple-rinsing for empty containers made of materials other than paper, inspection and maintenance of storage facilities and containers, recordkeeping, and a recovery plan for pesticide discharges.

Other Activities

The state employs accepted agricultural practices {AAPs} to control nonpoint source pollution. Since AAPs are not farm-specific--unlike BMPs--the state Department of Agriculture believes that they are more workable.

The state has spent $10,000 to support three projects that reduce pesticide usage, and $15,000 to enhance education on pesticide use to the general public and farmers.

Region II

New Jersey

New York

Puerto Rico

Virgin Islands

STATE PESTICIDE CONTROL ACTIVITIES: NEW JERSEY

New Jersey has not yet completed its ground-water protection strategy, although it is currently addressing the issue. The various agencies involved with the issue are working out the appropriate roles for each. The state's revised ground water classification system is under-going public review; the expected completion date is late 1988. Presently, policy calls for nondegradation except where necessary economic or social development justifies lower water quality. In no event may degradation impair existing designated uses.

Monitoring Program Review

The New Jersey Dept. of Environmental Protection {DEP} is working with other agencies on an ongoing project of monitoring drinking water aquifers in the State. The U.S. Geological Survey is the lead agency in the actual monitoring and in hydrogeological research. The Bureau of Pesticide Control within DEP assists by providing information on pesticide use patterns. The monitoring project has been going on for two years and is expected to continue for one more. DEP's Division of Science and Research has allocated resources to implement the project.

There have been some detections of low levels of pesticides in ground water. These include generally trace amounts of atrazine, propazine, and simazine, among others. Five of 31 samples showed positive for alachlor, in the .1 ppb to .2 ppb range; one sample showed 6 ppb, probably because the well was in a mixing area.

Regulatory Programs

New Jersey has both numeric and narrative ground water quality standards. It has adopted stringent numeric standards for aldrin, DDT, dieldrin, endrin, and toxaphene.

The state's narrative standards declare that DEP does not permit the introduction of pollutants into the ground water in concentrations known to be carcinogenic, mutagenic, toxic, or teratogenic. The department will direct its control efforts to the maximum extent possible to require their removal. In addition, existing and potential uses of ground water are to be maintained and protected. Where the quality of the ground water is inadequate to support designated uses, it is to be upgraded after the department has evaluated the threat to public health and the results of inaction relative to the protection of the ground water's present and potential uses.

New Jersey uses health-based drinking water standards for most of the state; in the Central Pine Barrens, however, where ground water feeds a fragile surface water ecosystem, ambient standards based on natural background ground water quality apply.

No degradation of ground water quality is allowed in that geographic area.

The state legislature recently passed a $100 million bond issue--the Clean Water Bond Act--to provide public water supplies in areas where unacceptable levels of contaminants have been found in private wells. Some of this money has been allocated by DEP to develop a wellhead protection program.

The Pesticide Control Act, passed in 1971, is the state law dealing with pesticide management. Under its authority, New Jersey collects applicator, pesticide dealer, and product registration fees. There has been some talk about establishing ground-water user fees and a tax on pesticide manufacturers to help pay for monitoring and other water protection programs.

The Bureau of Pesticide Control registers pesticides in the state, receiving advice and information from the Pesticide Review Committee. The bureau has the authority to restrict or refuse to register a pesticide in the state. For example, the bureau restricted the use of 2,4-D; commercial applicators have to be certified in order to mix or load 2,4-D. Farmers also have to be certified and take exams on how to safely apply it.

The Bureau also collects pesticide use data from farmers and commercial applicators; the data is submitted as a regulatory requirement. The Bureau is building a data base that will help it target areas for monitoring.

New Jersey is revising its regulations to require notification and disclosure of information prior to indoor pesticide applications and before spraying for lawn care.

The Bureau of Pesticide Control holds the enforcement authority, and may act if monitoring reveals significant pesticide residues.

Other Activities

State investigations into alternatives to chemical-intensive agriculture include extensive research on IPM by Rutgers University and state Department of Agriculture experiments with biological pest control.

STATE PESTICIDE CONTROL ACTIVITIES: NEW YORK

The state's Upstate and Long Island ground water protection strategies are complete and approved. New York classifies all fresh ground waters as potentially potable and applies the same ambient water quality standards and criteria for protection to all. The state assigns each body of water a "best use" classification indicating the most desirable use for that water. Water is deemed clean enough for its best use only if it meets numerical and narrative standards set by the state. These standards are more restrictive for drinking water than for fishing or swimming waters, and are also used to establish allowable wastewater discharges.

New York wants the flexibility to sometimes set more stringent ground water quality standards than federal drinking water standards and to take certain protective actions prior to MCL violations. The state Department of Environmental Conservation {DEC} and the state Department of Health {DOH} have program responsibility for most of the elements required for groundwater management.

New York favors tighter federal controls, ambient ground water quality standards and drinking water standards, user education, pesticide usage modifications and bans, and IPM to protect its ground waters from contamination by pesticides.

Monitoring Program Review

Cornell University scientists have been testing for pesticides in ground water in upstate areas. The study is being conducted for the New York State Department of Environmental Conservation, in concert with the state health and agriculture departments, the U.S. Geological Survey, and EPA. The scientists are examining the chemical characteristics of the pesticides, the kinds of uses, the soil and hydrogeology of the application sites. Seventy-two wells in high-vulnerability areas in 19 rural counties have been sampled for 7 pesticides. The pesticides detected in the samples included alachlor, atrazine, simazine, and a carbofuran metabolite. The report on the sampling project is scheduled for completion in October, 1988.

Additional samples taken from upstate agricultural areas have shown the presence of aldicarb in in the ground water.

Past monitoring, especially in Suffolk County, has detected several pesticides in the ground waters of the state, including aldicarb, dinoseb, picloram, oxamyl, carbaryl, methomyl, carbofuran, chlorothalonil, dacthal, and 1,2-D.

Regulatory Programs

New York has both numeric and narrative ambient ground water quality standards. The state has more numeric ambient standards than any other state. Its standards for 2,4-D, endrin, lindane, methoxychlor, toxaphene, and 2,4,5-TP silvex are more stringent than the federal drinking water standards for those pesticides. In addition, it has numeric standards for at least 43 other pesticides, including alachlor, aldrin, atrazine, carbofuran, dieldrin, heptachlor, mirex, propazine, and simazine.

New York has also proposed new drinking water quality standards, which are expected to be promulgated in the near future. These will include a category of "principal organic contaminants" {including some pesticides} with a standard of 5 ppb., and a category of other organic chemicals {including most remaining pesticides} with a standard of 50 ppb. Individual lower drinking water standards may be set for more toxic pesticides.

Class GA water is fresh ground water found in the saturated zone of unconsolidated deposits and consolidated rock or bedrock. Its best use is as a source of potable water supply. Quality standards for this water are the most stringent of the numeric standards listed for specific substances, the MCLs for drinking water or the standards for raw water promulgated by DOH, and the MCLs for drinking water set under the Safe Drinking Water Act.

Narrative standards cover contaminants that are not on the list of specific numeric standards. Toxic pollutants and other deleterious matter may not impair the quality of the ground water to render it unsafe or unsuitable as a potable water supply, nor may they cause or contribute to a condition that contravenes standards for other classified water of the state.

DEC regulates the registration, commercial use, and application of pesticides through the state Pesticide Control Program, administered in accordance with FIFRA. DEC registers all pesticides for use in the state, and requires permits for the distribution, sale, purchase, possession, and use of restricted use pesticides. It requires certification for commercial applicators. Dealers must maintain sales records for all restricted use pesticides. DEC also controls pesticide use through labeling and regulations for inclusion of instructions for all products sold.

Other Activities

New York has put into operation a statewide IPM program. The program reaches farmers through the Cooperative Extension Service, which assists farmers with the practice of IPM. County Soil and Water Conservation District and Cooperative Extension agents encourage the voluntary incorporation of BMPs in farm conservation plans.

Cornell University publishes an annual booklet that recommends pesticide application rates for specific crops. Timing and application instructions are also included. The Cooperative

Extension Service passes on these recommendations to farmers.

The New York State Water Resources Institute at Cornell University conducts research and fosters education on the ground water effects of agricultural chemicals. It designs training programs in pesticide application, mixing, and disposal. Researchers are currently evaluating the relationship between pesticide application practices, crop production, and ground water quality for potato crops.

The Water Resources Institute is also working with Cornell University faculty and state and federal agency personnel to develop Geographic Information Systems software for ground water management. In addition, the Institute is interested in studying the effects of soil organisms on chemical transport, microbial degradation of chemicals, transport of microbes within soil, and the toxic effects of ground water contaminants on ecological systems.

Another project in New York--in conjunction with the U.S. Geological Survey--is underway with field experiments that investigate the impact of no-till agriculture on pesticide contamination of ground water.

Faculty at Cornell, Oregon State, Michigan State, and the University of California at Davis have been developing a toxicological information system called EXTOXNET. The system will be used by Extension agents to answer their questions about current or potential contamination by agricultural chemicals.

Finally, New York is developing a statewide wellhead protection program.

At the local level, Suffolk County has participated in a project which includes mapping, data analysis, estimates of pesticide migration potential, sampling for agricultural chemicals, and installation of new monitoring wells. Reports on the ocurrence and movement of agricultural chemicals have been produced by the Suffolk County Department of Health Services for the North Fork and South Fork of Long Island.

STATE PESTICIDE CONTROL ACTIVITIES: PUERTO RICO

Monitoring Program Review

Puerto Rico monitors both surface and ground water through its Quality Assurance Program. Trace amounts of toxaphene were found in surface water. In tests for toxaphene in ground water in agricultural areas, samples proved negative using one sampling method, positive using another.

Regulatory Programs

At present, Puerto Rico has neither numeric nor narrative ground water quality standards.

The Pesticide Act of Puerto Rico, passed in 1953, has been amended several times, the latest in 1986. Puerto Rico has a certification program for pesticide applicators and conducts inspections as part of its misuse enforcement efforts.

Other Activities

Puerto Rico is not presently using or conducting research on IPM or low-input agriculture.

STATE PESTICIDE CONTROL ACTIVITIES: VIRGIN ISLANDS

Monitoring Program Review

There have been no reports of pesticide contamination to date in the Virgin Islands. The only monitoring done presently is testing public water supplies every two or three years. The Virgin Islands intends to do monitoring of ground water in the future because many islanders depend on wells for their drinking water.

Regulatory Programs

The Virgin Islands has narrative ground water quality standards.

Applicators of restricted use pesticides must be certified. One such pesticide in use on the islands is oxamyl.

The Virgin Islands attempts to follow FIFRA. Presently, it is working with EPA to develop stronger legislation followed by regulations. It wants legislation that takes local conditions into account. The only regulation currently in force is certification for restricted-use pesticides. There are no restrictions on imports or sales of pesticides in the Virgin Islands, nor do manufacturers have to register their products with EPA. The Islands want to expand their regulatory authority to cover these activities.

Other Activities

The Virgin Islands is considering using wellhead protection for sources of drinking water.

The Islands does not conduct research into nor employ IPM or low-input agriculture.

Region III

Delaware

Maryland

Pennsylvania

Virginia

West Virginia

PESTICIDE CONTROL ACTIVITIES: DELAWARE

The state's ground water protection strategy was completed in February 1988. Its goal is to ensure sufficient ground water quality and quantity for the protection of public health and for beneficial uses--including the preservation of significant ecological systems--now and in the future. Delaware has established a non-degradation policy for all ground water combined with proposed land use initiatives designed to place greater protection on current or future sources of drinking water. This policy applies to activities that could conceivably contaminate ground water, and does not necessarily require the restoration of ground water already contaminated.

Delaware does not have a ground water classification system, nor does it propose one as part of its strategy. It believes that such a system may in fact promote degradation of ground water deemed less valuable than others, and may be impossible to implement anyway due to the state's complex hydrogeology and the special variability in chemical quality of ground waters over the region.

Although there is little evidence of pesticides in Delaware's ground water, the state is concerned because pesticide contamination has occurred in states with similar hydrogeological conditions and agricultural practices.

Monitoring Program Review

Delaware monitors community public supply wells quarterly for chemical and radiological parameters. Non-community supplies are monitored less frequently. No pesticides have been found in public water systems. Domestic well water quality is generally not regulated in Delaware. In New Castle County, however, domestic well water must comply with the standards for public drinking water as a condition of occupancy. Moreover, mortgage companies often require testing before a mortgage is issued for new and existing home sales.

Some samples collected in agricultural fields have yielded trace amounts of atrazine. The state has conducted some recent testing for pesticides in ground water; one private well has been confirmed as containing paraquat as a result of a back-siphonage incident. Other results await confirmation.

The state Department of Agriculture has requested funds under the National Pesticide Survey in order to determine the extent of pesticide usage in Delaware.

Regulatory Programs

Delaware has narrative ground water quality standards; the Division of Public Health may prohibit the use of sources of water which for any reason may pose a threat to the public health. Regulations also require that water supplies be obtained from the most desirable source which is feasible, and effort must be made by the Department of Natural Resources to prevent or control pollution of the source.

The state has a Pesticide Law, last amended in 1985. New regulations were promulgated in September 1987. Delaware has assigned the Department of Agriculture with the authority to: regulate the sale, use and application of pesticides, require that pesticides sold in the state be correctly labeled with warnings and adequate directions for use, and restrict the use of any pesticides found to be so hazardous to humans or to the environment that restrictions are necessary in the public interest, weighing the benefits and risks of that use.

The Department requires that every pesticide distributed and/or used within the state be registered. It charges an annual registration fee of $25 per pesticide.

The Department may proscribe methods of pesticide application, including amount and concentration, time, place, and manner of application. It may also restrict or prohibit the use of pesticides in certain areas for specified periods of time. In addition, the Department may require a permit for purchase, possession, and application of a pesticide labeled for a use it has designated as a "state restricted pesticide use."

Any person who applies pesticides to the lands of another must be licensed as a certified commercial applicator. This may include, but not be limited to, pest control applicators, ornamental, agricultural, and right-of-way pesticide applicators. Applicants for certification must pass an examination; commercial applicators must also pay an annual certification fee.

Private applicators of restricted use pesticides must also be certified. Applicants must pass either a written or oral examination

The Department of Agriculture is responsible for misuse investigation and enforcement. Violations are classified as misdemeanors. Private applicators are exempt from fines under the pesticide law, although they may be liable for damages to other persons or lands caused by their use of pesticides--even where such use conforms to the rules and regulations of the Department. The Department may order any distributor or applicator to stop the illegal sale or use of a pesticide and may confiscate supplies, if necessary.

The state regulates pesticide and pesticide container disposal, pesticide storage, and the use and maintenance of pesticide mixing, storage, and application equipment.

Delaware requires certified commercial applicators to maintain pesticide use records, and may require applicators of restricted use pesticides to do so. Dealers of restricted use pesticides are required to keep sales records for two years.

The state has proposed to involve state and county/local governments in a resource protection area {RPA} concept. The concept envisions using land use restrictions to reduce the threat of contamination in two ground water RPA's: wellhead protection areas and critical recharge areas. Theoretically, such restrictions could apply to pesticide usage in these areas, if appropriate.

In instances of contaminated wells, the state has a revolving fund which provides for replacement wells or an alternative water supply when the responsible party is unknown.

In 1987, Delaware placed restrictions on the distribution, possession, sale, and use of any marine antifoulant paint containing tributyltin {TBT}.

Finally, all applications of pesticides are by regulation subject to BMP's.

Other Activities

There is one IPM specialist on the staff at the University of Delaware who works through the Cooperative Extension Agents. The state will request $50,000 from the legislature in 1989 for research on alternative agriculture.

Delaware participates with the Water Resources Division of the U.S. Geological Survey in basic data collection, water resource and water quality research.

The Conservation Districts of New Castle, Kent and Sussex Counties advise farmers and landowners on ground water quality issues, BMP's and other related agricultural issues.

The state advocates linking the ground water data bases of various state agencies, and implementing quality controls to ensure that the data are adequate for the intended uses. Furthermore, Delaware is investigating purchase of a Geographic Information System for capturing, storing, updating, analyzing, and displaying mapped natural resources data.

Delaware identifies a need for additional research on pesticide retention/mobility in soil and water.

STATE PESTICIDE CONTROL ACTIVITIES: MARYLAND

The state completed its ground water protection strategy in 1986.

Monitoring Program Review

In the summer and autumn of 1983, the state conducted a ground water monitoring survey for pesticides. The survey was limited to 30 wells (36 samples) with known high nitrate levels--indicating areas permeable to contaminants. Wells were sampled over a wide geographic area in "no-till" farming areas. No-till farming generally uses large amounts of herbicides. Both public and private wells were sampled. Ten of the wells (33%) showed residues of from .1 ppb to 4 ppb for six herbicides: alachlor (4 wells), atrazine (3 wells), paraquat (2 wells), simazine (1 well), atratone (1 well), and treflan (1 well).

Regulatory Programs

Maryland has both numeric and narrative ground water quality standards. It has adopted the federal drinking water standards for 2,4-D, endrin, lindane, methoxychlor, toxaphene, and 2,4,5-TP silvex.

The state's narrative standards apply the state's numeric standards to any type I aquifer. A type I aquifer has a transmissivity greater than 1,000 gallons per day per foot, a permeability greater than 100 gallons per day per foot, and a total dissolved solids concentration less than 500 milligrams per liter.

The Department of Agriculture has the authority to enforce the application of pesticides, while the Department of Health and Mental Hygiene controls pesticides and other contaminants directly affecting drinking water.

State regulations require a dealer of a restricted use pesticide to obtain a permit, and an applicator of an experimental use pesticide to provide the state Department of Agriculture with information on the location of the application, the pesticide's active ingredients, and its toxicological profile.

The Secretary of Agriculture may adopt pesticide use classifications to regulate pesticide application in the state. The state certifies certain applicators and may require proof of liability insurance. Commercial applicators are required to provide customers with specific information regarding pesticide use.

The Department of Agriculture conducts misuse investigation and enforcement, and may impose civil penalties for violations of pesticide laws.

Other Activities

Maryland has a rudimentary ground water classification system, and is implementing wellhead protection activities at the county level.

STATE PESTICIDE CONTROL ACTIVITIES: PENNSYLVANIA

The state has a draft ground-water protection strategy in place. The final strategy is scheduled for completion late in 1988. Pennsylvania is presently developing a ground water classification system.

To protect ground water from contamination by pesticides, the state Department of Environmental Resources recommends using, among other things, national generic measures-including cancellations of pesticides posing widespread and serious threats and national labeling requirements, enhanced user training, pesticide use regulation, and user liability for contamination of ground water by restricted use pesticides.

Monitoring Program Review

Pennsylvania has the rudiments of a comprehensive monitoring program in place. The only ongoing monitoring for pesticides the state is doing is in conjunction with the National Pesticide Survey.

Pennsylvania has found traces or more of at least 26 pesticides in wells and springs. In almost all cases, the concentrations were less than the Health Advisory {HA} for the particular pesticide--most less than 1 ppb. Some of the pesticides commonly tested for include alachlor, atrazine, metolachlor, simazine, toxaphene, propazine, and cyanazine. Three of eight wells sampled for endrin and four of eighteen for lindane had concentrations above the HAs for each of the two pesticides. Concentrations of five other pesticides exceeded HAs in one or two wells only of the many sampled for each pesticide; officials suspect that most of these high concentrations were the result of spills. There are five to six pesticide spills per year handled by the Bureau of Water Quality Management.

Regulatory Programs

At present, Pennsylvania has neither numeric nor narrative ground water quality standards.

The Pennsylvania Clean Streams Law provides that any source of contamination which threatens a stream should be cleaned up if necessary to protect public health or the environment. In principle, this would include contamination from nonpoint application of pesticides.

By law every pesticide distributed in the state must be registered with the Secretary of Agriculture. The secretary may require specific information pertaining to the registration of a pesticide, including a list of all active or inert ingredients and a full description of any tests that have been conducted. All commercial applicators must be licensed, and the secretary may categorize application licenses and set criteria for the granting of licenses--requiring applicators to provide evidence of financial responsibility, for example. The Secretary has the authority to suspend, revoke or modify any license.

The state also promulgates regulations for the certification of commercial, private, and public pesticide applicators. It sets pesticide use criteria for non-certified applicators and for application technicians. It prohibits the purchase of any restricted use pesticide by a non-certified applicator or the application of a restricted use pesticide within 100 feet of a publicly owned area unless a waiver is granted by the Secretary of Agriculture.

Other Activities

Penn State University and three other universities are studying the environmental fate of pesticides under minimum and conventional tillage, respectively. Penn State is also involved in a cooperative venture to determine how to reduce nonpoint pollution--including that by pesticides--in Chesapeake Bay. Moreover, the University participates in a well-funded program to develop expert systems for pest management on all crops. The systems will use artificial intelligence computers to provide decision-making assistance.

In addition, Penn State is interested in developing insect and disease forecasting and monitoring techniques; these include the counting of insects and the use of weather-based data to predict the occurrence of plant pathogens in food crops. Finally, the University is studying pest resistance in apples in a cooperative project with the University of Vermont and four or five other states, and how to increase resistance in host or crop plants through selective plant breeding.

STATE PESTICIDE CONTROL ACTIVITIES: VIRGINIA

Virginia's ground water protection strategy was completed in 1987. The Virginia Water Control Law created a nondegradation policy for all waters of the state--including ground water. The policy mandates the protection of existing high quality waters and provides for the restoration of all other waters to a quality that will allow all reasonable public uses. Virginia's water quality standards, however, permit variances based on economic and social considerations and mixing zones where some change in ground water quality is allowed.

The state ground water protection strategy document states that pesticides are a significant potential threat to ground water quality and one that has not yet been addressed. In fact, pesticides and fertilizers is one of five potential sources of ground water contamination assigned top priority in the strategy document. To better protect ground water from pesticides, the strategy recommends: a further exploration of the potential of federal laws such as FIFRA and the Toxic Substances Control Act to protect ground water from pesticides; more federal research on the adverse health effects of pesticides in drinking water and on the effects of agricultural practices on pesticide leaching; education and training programs for commercial applicators, farmers, and extension agents on the ground water implications of pesticide use; ground water monitoring targeted to vulnerable areas of agricultural chemical use; and expanded use of IPM.

Monitoring Program Review

Monitoring is conducted on a case-by-case basis for known sites. In addition, Virginia is participating in the national pesticide in ground water survey. A task force will be working with the state Health Department to monitor for pesticides in agricultural areas in three counties. One limitation in getting good data is that the method of analyzing samples used thus far detects only parent compounds and not the break-down products. The state's ground water protection strategy recommends that state agencies develop ground water monitoring programs for agricultural chemicals, targeting specific areas based on ground water vulnerability, crop production, and chemicals used.

Pesticides detected in the ground water include chlordane {from domestic termite control}, EDB, and arsenic.

Regulatory Programs

Virginia has both numeric and narrative ground water quality standards, including standards for the following pesticides: 2,4-D, endrin, lindane, toxaphene, 2,4,5-TP silvex, aldrin, chlordane, DDT, dieldrin, heptachlor, heptachlor epoxide, kepone, and mirex. The state's narrative standards require that all water be free of contaminants in concentrations or amounts that contravene established standards, interfere directly or indirectly with reasonable and beneficial uses of water, or harm human, animal, plant, or aquatic life.

To improve inter-agency coordination in ground water protection activities, Virginia created the Office of the Secretary of Natural Resources. The state's ground water protection strategy recommends that the Secretary direct each agency with ground water protection responsibilities to prepare, under the leadership of the VWCB, a plan to meet ground water quality standards. Primary responsibilities for permitting, regulating, corrective action, and enforcement would rest, then, with those agencies with direct source reponsibilities, and be generally consistent with ground water quality standards.

In 1973, the Virginia Groundwater Act authorized the Virginia Water Control Board to establish ground water management areas, in which persons who use ground water must obtain permits unless they are exempted from the Act. Agricultural users are presently exempted from the Act. Although the Act focuses on ground water quantity concerns, it does allow for the creation of ground water management areas where ground water has been or may be reasonably expected to become polluted. This provision of the Act has never been invoked.

The Virginia Department of Agriculture and Consumer Services {VDACS} has the authority under the state Pesticide Law for registrating the use and distribution of pesticides and for regulating their labeling, use, and handling. VDACS requires certification for commercial and private applicators of restricted use pesticides. The Department requires permits for the use of aldicarb, and it also conducts misuse investigations and enforcement.

The Pesticides Task Force, a group of representatives from state agencies with regulatory control or concern for pesticide management, monitors pesticide-related issues. The Task Force makes recommendations on actions to deal with pesticide-related problems, and may assist in developing a coordinated state response to an issue.

Virginia believes that local governments should play a greater role in ground water protection. Local governments have responsibility over many activities which may affect ground water, such as erosion control. Through this activity, for example, a local government may enhance the protection of ground water in sensitive areas by discouraging "no-till" practices which rely on heavy chemical use.

Counties in the state are currently planning and building consensus for wellhead protection activities.

Other Activities

Virginia works through the County Extension Agents to educate farmers on the use of best management practices. The state is also developing a nonpoint source management plan for

Chesapeake Bay.

VDACS has distributed populations of insect predators to farmers as part of its IPM program.

The ground water protection strategy recommends that the state develop a ground water management handbook to provide a detailed set of guidelines, standards, and procedures for state agency personnel. For example, it might specify site examination requirements, monitoring and reporting requirements, maintenance and inspection standards, public participation requirements, and enforcement standards.

The strategy also recommends that an ongoing Data Management Task Force be created to help develop a coordinated data collection, management, and use system that will contain reliable information on Virginia's ground water resources.

The Virginia Water Resources Center has developed instructional materials, exhibits, and publications on ground water protection. Center staff make presentations to community groups on ground water issues and conduct institutes for extension and agency personnel. The Center has prepared a workshop and handbook to educate local officials on ground water issues. The Virginia Extension Service conducts ground water educational activities for the agricultural community as well as local citizens, local government staff, and students. County health departments, utilities, and the Soil Conservation Service also conduct limited educational activities.

The Groundwater Protection Steering Committee, which developed the state's ground water protection strategy, cited a need for additional financial and personnel resources in order to carry out an effective strategy. It is interested in developing a detailed program assessment of monetary and staff needs for consideration by the Governor and the legislature.

STATE PESTICIDE CONTROL ACTIVITIES: WEST VIRGINIA

The state has a ground-water protection strategy in place, completed in 1987. Its ground-water management policy provides that the state protect ground water as necessary to sustain present and future beneficial uses, and at existing quality where such quality is better than the criteria set for the designated use, unless granted exception by the Water Resources Board. A 1986 assessment of then-current programs and activities related to ground-water management assigned highest priority to development and implementation of a regulatory framework. Legislation to bring this about will be drafted.

Monitoring Program Review

The West Virginia Department of Health {DOH} monitors drinking water for certain pesticides. The Plant Pest Control Division of the Department of Agriculture monitors streams for pesticide residues. Some monitoring is also done near agricultural chemical facilities through NPDES permits. The resource subcommittee of the Ground Water Advisory Committee has developed a proposal for a state ambient ground water monitoring network. The U.S. Geological Survey is developing a more detailed plan.

Approximately 30 percent of samples taken in 1983 tested positive for picloram, compared to less than two percent of the samples in 1985. The reduction was attributed to picloram training sessions conducted by the Plant Pest Control Division.

Regulatory Programs

West Virginia has narrative ground water quality standards; they pertain only to owners and operators of hazardous-waste management facilities. A proposal to adopt numeric ground water quality standards will be considered by the Water Resources Board.

The Department of Agriculture is the lead agency in the promulgation and enforcement of regulations on the application of pesticides. The Commissioner of Agriculture may place restrictions on the use of any pesticide. The Department also has enforcement authority against persons who transport, store, or dispose of pesticides or pesticide containers in a way that causes injury to humans or, conceivably, contaminates ground water.

In 1986 the Pesticide Use and Application Act was amended. The act requires that the Commissioner of Agriculture license all commercial applicators. It sets licensing criteria and authorizes the Commissioner to suspend, revoke, or modify any license provision under certain conditions. It also establishes penalties for violations of the act and authorizes the Commissioner to promulgate regulations permitting consent agreements or negotiated settlements for civil penalties. The Act further prohibits municipalities or counties from enacting laws or ordinances regarding the regulation of pesticide use and application.

The Governor authorized the Department of Health to develop a wellhead protection program; the program is still in the consensus-building stage.

The West Virginia Groundwater Protection Act (Senate Bill No. 463) failed to pass the 1988 Legislature. The purposes of the bill were: to designate the Department of Natural Resources as the lead agency for ground-water protection; to establish a more comprehensive state ground-water protection program; to adopt ground-water quality standards (at least as stringent as EPA's maximum contaminant levels); to define the roles of state agencies with respect to ground-water protection; to maintain the quality of ground water at a level which will protect present and future uses; to develop a central ground water data management system; to develop a public education and ground-water protection promotion program; to establish an ongoing ground-water sampling program and; to authorize citizens' suits for presumed violations of the act. A similar bill will be introduced in January 1989.

Other Activities

The Departments of Health and Natural Resources are working together to designate areas in the state which are potentially vulnerable to contamination. The state intends to use this information in developing its wellhead protection plan.

The Division of Water Resources, in cooperation with the U.S. Geological Survey, is continuing to compile and enter information into a ground water data base. This information is necessary in order to manage the state's ground water resources.

A prototype system to collect information about and respond to ground water contamination complaints is under-going a trial run within the Division of Water Resources.

The U.S. Geological Survey (USGS), the West Virginia Geological and Economical Survey (WVGES), and state universities and colleges conduct ground water research. The USGS, in cooperation with WVGES and DNR, has published an 11-part series of ground water hydrology atlases covering the entire state.

West Virginia University (WVU) has done research on the fate of herbicides in soil and ground water. The WVU Cooperative Extension Service trains pesticide operators, advises farmers on pesticide usage and other ground water concerns, conducts soil analyses, and provides public information and education programs on ground-water protection and contamination abatement.

The Director of the Department of Natural Resources established a Ground Water Advisory Committee in 1986. This committee includes representatives from industry, federal, state, and local agencies or organizations, agriculture, and civic and environmental groups. Its purpose is to advise the Department of Natural Resources on issues and concerns that arise during the development and implementation of the state ground-water management program.

In addition to advisory committees, the state is planning public speaking engagements, ground-water newsletter articles, and other activities to maintain public contact and provide opportunity for public participation in ground-water programs.

Region IV

Alabama

Florida

Georgia

Kentucky

Mississippi

North Carolina

South Carolina

Tennessee

STATE PESTICIDE CONTROL ACTIVITIES: ALABAMA

Alabama is currently revising its draft ground water protection strategy, with completion expected in FY 1988.

Monitoring Program Review

No data.

Regulatory Programs

At present, Alabama has neither numeric nor narrative ground water quality standards.

Bills currently before the legislature would authorize wellhead protection programs.

Other Activities

EPA Region IV personnel sponsor annual meetings with state ground water program directors and conduct conferences which include topics on ground water classification, wellhead protection, data management, and Geographic Information Systems for the National Pesticides Survey.

Alabama has proposed to support limited wellhead protection activities in several counties with vulnerable water supply systems.

STATE PESTICIDE CONTROL ACTIVITIES: FLORIDA

The state's ground water protection strategy will be published as a single document in FY 1988.

Florida has a comprehensive ground water management program of policy, regulations, and governmental framework. The program utilizes ground water classification, a permit system for controlling surface activities, ground water quality standards, a statewide monitoring program, research, and public education to protect ground water from contaminants--including pesticides. The Department of Environmental Regulation manages the ground water quality program, which is carried out by its six district offices. In addition, five water management districts manage the water resources within their district. Ground water protection activities conducted by either the offices or the management districts are site-specific.

The state employs a differential approach to ground water protection, ranging from non-degradation of sole-source drinking water supplies to allowing degradation, such as waste injection, of nonpotable saline aquifers.

Monitoring Program Review

As a result of the Florida Water Quality Assurance Act of 1983, Florida has an extensive ground water monitoring network in place aimed at monitoring the impact of pesticide application on ground water aquifers. The state monitors for 63 pesticides.

In a monitoring study that tested 300 drinking water wells near areas of heavy pesticide use, the state Departments of Agriculture and Consumer Services and Environmental Regulation found eight pesticides in 10 wells: alachlor, aldicarb, atrazine, bromacil, 1,2-D, EDB, metolachlor, and simazine. The presence of these pesticides was not found to be widespread. In an earlier well testing program conducted in 1983-84, of 4,978 wells tested in 47 counties, EDB was found in about 13%. 2,4,5-TP silvex and lindane have also been detected in the state's ground water.

Since 1982, Florida has conducted an annual survey of the restricted use pesticides. It is in the midst of a 30 county survey that will examine nonpoint sources of pesticide applications in what amounts to about 90% of the agricultural areas of the state.

Regulatory Programs

Florida has both numeric and narrative ground water quality standards. It applies the numeric federal drinking water standards to 2,4-D, endrin, lindane, methoxychlor, toxaphene, and 2,4,5-TP silvex.

The narrative standards state that all ground water is to be free of agricultural chemicals in concentrations which are: {1} harmful to soil organisms responsible for the treatment of permitted discharges; {2} carcinogenic, mutagenic, teratogenic, or toxic to humans, unless specific criteria have been set for them; {3} are acutely toxic to indigenous species important for the aquatic community within surface water affected by ground water at the contact point between the two; {4} threaten public health; {5} create a nuisance; or {6} impair reasonable and beneficial use of adjacent water.

Florida has a 4-tiered ground water classification system of differential protection, with two zones of protection for major municipal wells under the wellhead protection rule {G-I}. Currently, three counties have wellhead protection programs, with other counties considering them. A new law expands the state's ability to regulate well construction and siting. State law also requires local governments' comprehensive plans to include strategies for protecting aquifer recharge areas. Such areas are to be considered in zoning and land use decisions.

The state Department of Agriculture and Consumer Services conducts misuse investigations and enforcements. Failure to disclose pesticide use information can lead to disciplinary action. Damages to a person's property due to misapplication of pesticides can be recovered from the responsible party; If contamination results from application according to the label, however, the applicator is not liable.

A committee reviews the registration of pesticides for use in the state, and has imposed use restrictions on some pesticides. The Department of Environmental Regulation works with the committee in the registration process. Placing restrictions on pesticides currently on the market because of ground water contamination concerns has gone slowly in Florida; refusing to reregister products is a more prevalent practice. The Water Quality Assurance Act of 1983 established the Pesticide Review Review Council, which has advisory, policy oversight, and coordination responsibilities, and provides technical assistance on the use of new pesticides in the state.

The use of aldicarb is banned within 300' from a drinking water well; this ban is extended to 1000' in areas of highly permeable soils.

The Water Quality Assurance Act provided funds for ground water cleanup. The Department of Environmental Regulation is directly involved in this effort. Their major focus has been on the remedial action undertaken for EDB-contaminated water. The funds are raised through a tax on each barrel of pesticides manufactured in the state.

Other Activities

Florida has studied the hydrogeological, soil, and environmental conditions of 10 major agricultural counties. It is developing an overlay mapping system, and acknowledges a need for better computer modeling and graphics capability as well as additional research on the environmental fate of pesticides. In addition, it wants better pesticide use information, analytical support for pesticides, and better quality control procedures.

Florida is working on the development of best management practices, and on various alternatives to high-input agriculture. The institution of biological control of pests, for example, has reduced the use of malathion in the state by 50%. The state is also involved in insect sterilization projects.

STATE PESTICIDE CONTROL ACTIVITIES: GEORGIA

Because of new ground water initiatives, the state is revising its 1986 ground water management plan. To protect its ground water, Georgia emphasizes ambient monitoring, recharge area protection, and water quality standards. It stresses an educational approach--such as lowering of application rates--for protecting ground water from contamination by pesticides.

Monitoring Program Review

Georgia occasionally monitors ground water for pesticides. Monitoring was done in Seminole County after EDB was detected in some water supply systems. In the past, EPA has paid the U.S. Geological Survey to collect samples.

Regulatory Programs

Georgia has both numeric and narrative ground water standards. The state has adopted the EPA drinking water standards for several pesticides: 2,4-D, endrin, lindane, methoxychlor, toxaphene, and 2,4,5-TP silvex. Its narrative standards, as they apply to pesticides, declare that all water is to be free from toxic substances discharged from municipalities, industries, or other sources in amounts, concentrations, or combinations that are harmful to humans, animals, or aquatic life.

State laws that address ground water protection include the Water Quality Control Act, the Safe Drinking Water Act, and the Ground Water Use Act.

The Department of Agriculture, Pesticides Division has misuse investigation and enforcement authority.

As part of its recharge/discharge area protection plan, the state is identifying ground water resource areas susceptible to pollution.

Other Activities

Georgia is improving its ground water data management capabilities and is developing a Geographic Information System.

STATE PESTICIDE CONTROL ACTIVITIES: KENTUCKY

The Division of Pesticides within the Kentucky Department of Agriculture and the Division of Water within the state Department for Environmental Protection--with advice from the Ground Water Advisory Council--completed a ground water protection strategy, which was released in November of 1987.

The state will apply a differential management approach to three classes of ground water, ranging from nondegradation of certain parts of aquifers supplying highest priority drinking water sources or special resource areas {Class I waters} to some degradation of non-potable ground water {Class III waters} allowed in particular instances.

The state is working on a plan for keeping pesticides out of its ground water. It does not believe that pesticide contamination of ground water is a big problem in the state.

Monitoring Program Review

The Division of Water conducts on-going monitoring of public and semi-public water supplies. The state Department of Agriculture {DOA} monitors on a case-by-case basis as part of its misuse investigation responsibility. It has occasionally found pesticides in ground water, apparently as a result of right-of-way applications. In general, DOA has detected pesticides in ground water at levels which cause no public health concern.

The state sampled private wells in two studies in 1987. The findings for one study were published in November, 1987 while findings for the other have yet to come out. No pesticides were found in either study; the study designs, however, were not intended to test for pesticides in ground water per se.

The Kentucky Geological Survey has announced its intention to conduct a pesticide study in Kentucky.

Regulatory Programs

Kentucky is developing both numeric and narrative ground water quality standards. It will probably adopt the federal drinking water standards for the pesticides covered therein: 2,4-D, endrin, lindane, methoxychlor, toxaphene, and 2,4,5-TP silvex. The state's narrative standards will most likely stress the protection of existing ground water quality for class I and II waters.

Under the authority of two state laws, KRS 151 and KRS 224, Kentucky is in the initial stages of drafting regulations which will establish a ground water classification system and a ground water discharge permit system. The classification system is essentially the same as EPA's system, with some adjustments for situations particular to Kentucky.

The system divides the state's aquifers into class I, II, and III ground waters. Class I waters are sources of public water supplies and special resource areas, such as karst areas or areas which harbor endangered species (e.g., Mammoth Cave). Class II waters are existing or potential sources of potable water, while Class III waters represent non-potable ground water sources. The state will probably consider all ground water as class II waters unless a determination is made otherwise.

The state DOA registers pesticides used, sold, or distributed in the state, and enforces the federal requirements under FIFRA, including label requirements that address pesticide use, handling, and disposal. DOA investigates and enforces misuse incidents, while a state emergency response team has been created to respond to spills.

All commercial applicators must be certified and licensed. In addition, certification is required of all handlers of restricted use pesticides--including farmers. The state Cooperative Extension Service enforces the training requirement for certification.

Under additional DOA regulations, all certified applicators must maintain pesticide use records. Commercial dealers must keep sales records of restricted use pesticides for two years.

Other Activities

Kentucky is implementing an IPM program with the assistance of the state Cooperative Extension Service, which conducts the IPM training sessions with farmers. Instruction in the use of best management practices is also a part of farmer training programs.

The state has hired a person to begin a pilot wellhead protection project; it will target three areas of the state, using EPA grant money do to the field work.

Finally, Kentucky collects water quality data on wells and springs. It will possibly begin an aquifer mapping project in the future.

STATE PESTICIDE CONTROL ACTIVITIES: MISSISSIPPI

Mississippi completed its ground water protection strategy in FY 1987. It is considering adopting EPA's ground water classification system and setting ground water quality standards. The goal of the ground water protection strategy is to prevent conamination of the state's ground water resources. The strategy recommends a pesticide management plan, but does not address this issue.

Monitoring Program Review

Mississippi has begun an Agrichemical Groundwater Monitoring Program, and should collect ground water quality samples by the Spring of 1989. Legislation put into effect in 1987 allows the Department of Agriculture and Commerce to increase registration fees to defray the cost of the program.

Regulatory Programs

At present, Mississippi has neither numeric nor narrative ground water quality standards; work in this area, however, is in progress.

The Division of Plant Industry of the Mississippi Department of Agriculture and Commerce is responsible for the administration and enforcement of statutes concerning the registration, labeling, distribution, use and application of pesticides. The Department has placed restrictions on the use of the chlorophenoxy herbicides, such as 2,4-D and 2,4,5-T.

Mississippi has a Water Pollution Control Act that gives broad protection to both surface and ground waters.

The state has an Emergency Response Program which is funded by a pollution abatement fund made up of fines collected from violators. The state also uses CERCLA funds for remedial activities.

Mississippi is developing a limited wellhead protection program. The Southern Hills Regional Aquifer System in southeastern Louisiana and southwestern Missippi has been designated a sole source aquifer pursuant to Section 1424 {e} of the Safe Drinking Water Act. The designation has been submitted by the capital area Ground-Water Conservation Commission of Baton Rouge, Louisiana to the EPA Region VI office in Dallas.

Other Activities

The Entomology Department of the Mississippi Cooperative Extension Service, Mississippi State University is responsible for public education on pesticide/ground water issues, and for user education and training programs for pesticide applicators.

Currently, there is only a very limited integrated pest management program on cotton. Discussions are now underway to more closely assess this program. Mississippi is encouraging the use of best management practices.

Although an integrated data management system on hydrogeological, ground water, and pesticide information does not exist at present, the state has recognized the importance of such a system.

STATE PESTICIDE CONTROL ACTIVITIES: NORTH CAROLINA

North Carolina completed a draft ground water protection strategy in 1987, and is expecting to finish its final strategy in FY 1988. The state has classified its ground water into five classes, based on quality and depth. Water quality standards and pesticide use regulations may be used to protect the ground water from pesticide contamination.

Monitoring Program Review

The state Departments of Natural Resources and Community Development and Agriculture conducted a joint monitoring effort for aldicarb and EDB, and nothing was detected in any of the samples.

Regulatory Programs

North Carolina has both numeric and narrative ground water standards. The numeric standards for pesticides are EPA's drinking water standards for 2,4-D, endrin, lindane, methoxychlor, toxaphene, and 2,4,5-TP silvex.

Narrative standards declare that the state's maximum contaminant levels for toxic and deleterious substances may not be exceeded, and for substances not specified, the standard is the naturally occurring concentration, as determined by the director of the Division of Environmental Management of the Department of Natural Resources and Community Development. Synthetic and other substances that do not occur naturally are prohibited.

A law passed in 1987 authorizes the state Pesticide Board to request a full description of the tests made and the results of such tests for any pesticide to be used in the state. The law also requires the licensing of pesticide dealers who sale or distribute restricted use pesticides. The board regulates the disposal of pesticides and is empowered to stop the sale or use of any pesticide whose application violates the labeling requirements.

Other Activities

North Carolina has compiled an inventory of contaminated sites, and has formulated incident response-management procedures.

STATE PESTICIDE CONTROL ACTIVITIES: SOUTH CAROLINA

South Carolina completed its ground water protection strategy in 1987. Numerous fish kills in recent years have heightened public concern about pesticide use in coastal areas. The state has a three-tiered ground water classification system based on highest potential use.

Monitoring Program Review

The Department of Health and Environmental Control monitors public drinking water supplies for maximum contaminant levels.

Regulatory Programs

South Carolina has both numeric and narrative standards for ground water. The state has adopted EPA's primary drinking water standards for several pesticides. Narrative standards state that high temperature and corrosive, deleterious, and toxic substances attributable to sewage and industrial or other waste in concentrations or combinations that interfere with classified water uses {except within mixing zones} or existing water uses or that are harmful to human, animal, plant, or aquatic life are prohibited.

A 1986 state law requires that any irrigation system designed or used for application of fertilizers, pesticides, or other chemicals be equipped with an anti-siphon device. The Division of Regulatory and Public Services Programs at Clemson University must promulgate the rules and regulations necessary to implement and enforce the law.

The Division at Clemson is the enforcement authority for pesticide-related regulations except those for pesticide disposal, which the Department of Health and Environmental Control regulates.

Other Activities

The state Cooperative Extension Service and the Department of Fertilizer and Pesticide Control conduct numerous pesticide user educational programs for certified applicators, dealers, and the public.

Clemson University has an IPM Coordinator and a number of active IPM programs for both major and minor crops.

University of South Carolina environmental health science researchers have studied the effects of pesticides from nonpoint sources on both target and non-target fish populations in coastal areas of the state.

STATE PESTICIDE CONTROL ACTIVITIES: TENNESSEE

The Tennessee Water Quality Control Board adopted a draft ground water protection strategy in August, 1988, with the final strategy to follow public hearings in 1988-89. The draft strategy recommends a policy of differential protection while striving for an ideal goal of prevention of contamination. It shall consider both quality and quantity in efforts to protect, conserve, and restore when necessary, the resource for existing and potential beneficial uses. Both the environmental and economic values of ground water will be recognized. The greatest protection will be given existing and potential drinking water.

The draft strategy ranks potential contamination from pesticides as a medium priority issue. To control pesticide contamination of ground water from nonpoint sources, the strategy proposes for now a predominantly non-regulatory approach {e.g., best management practices, acceptable management practices, etc.}. Recommended regulations will be discussed in a later section of this summary.

Monitoring Program Review

Very little monitoring for pesticides has been done in the state; consequently there is no data to reflect a problem from pesticide contamination. Monitoring to date has been limited to pesticide disposal sites. A need to monitor for pesticides possibly exists in the heavily agricultural western part of Tennessee, especially near aquifer recharge areas. Legislation to establish a state-wide monitoring and cleanup program failed to pass this year.

Regulatory Programs

At this time, Tennessee has neither numeric nor narrative ground water quality standards.

Tennessee relies on "point of use" water quality standards established under the federal Safe Drinking Water Act. The draft strategy recommends that these standards apply also to ground water at a compliance boundary near the source of potential contamination prior to withdrawal and treatment.

The state is in the process of adopting a ground water classification system. The draft strategy suggests that the state use the existing system adopted by the Tennessee Water Quality Control Board in 1985. It requires no enabling legislation since it was included as part of current law--the Tennessee Water Quality Control Act. Essentially, the system divides all ground water into two classes: water for beneficial uses and water for receiving underground wastes. Source controls and water quality standards will be applied differentially to each class.

The state Water Quality Control Act gives Tennessee the authority to protect its ground water. Agriculture and silviculture, however, are exempted from the act. The Department of Health and Environment has requested legislative action to remove that exemption.

Tennessee has adopted FIFRA requirements for the labeling, registration, and use of pesticides and has enacted laws and regulations governing private and commercial pesticide applicators. The state requires the training and licensing of commercial applicators and certification of private applicators who use restricted use pesticides. The state Department of Agriculture {DOA}, Division of Plant Industries is primarily responsible for regulating the use, sale, handling, and disposal of pesticides.

The strategy identifies runoff and infiltration from cropland as two main avenues of pesticide contamination. It suggests: {1} educating farmers to the dangers of indiscriminate application of pesticides; {2} a review and intensification, if necessary, of the training program for certification of applicators; {3} buffer strips between non-aerial application zones and wells or water bodies; and {4} identification of aquifer recharge areas and close monitoring for pesticides in these areas.

The strategy further recommends that local authority be used to protect ground water: local zoning power to regulate land uses; county and municipal ordinances to protect public health and welfare; and county health department regulations. It suggests that the state offer technical and financial assistance--in addition to requesting federal matching funds--to local governments for defining and implementing wellhead and recharge protection programs. Moreover, it recommends that legislation be enacted to empower the Water Quality Control Board to resolve inter-jurisdictional disputes involving ground water.

Other Activities

Legislation this year--which did not pass--proposed establishing a ground water protection fee for buyers of agricultural pesticides and fertilizers. Also included was a container-deposit bill, which sought to ensure that empty pesticide containers were returned for re-cycling, or were triple-rinsed and ready for proper disposal.

Tennessee encourages the use of best management practices {BMPs}. The state Department of Agriculture provides education and training in BMPs to farmers in concert with County Extension Agents.

The draft strategy recommends building a state-wide coordinated information base consisting of data on the physical characteristics of ground water, ground water quality parameters, current uses of ground water, status and location of known pollution sites and high risk sources, and risk data for potential contaminants.

The Department of Health and Environment suggests establishing a ground water remediation fund to address nonpoint sources of contamination, such as field application of pesticides. This fund would apply to sites that would not normally fall under Superfund.

Region V

Illinois

Indiana

Michigan

Minnesota

Ohio

Wisconsin

STATE PESTICIDE CONTROL ACTIVITIES: ILLINOIS

Illinois completed its ground water protection strategy in 1986. It is currently being implemented. The strategy focuses on the nondegradation of ground water for beneficial uses. Although pesticide contamination of ground water is not widespread, the state's heavy reliance on pesticides has led it to establish an ongoing pesticide monitoring program, and to develop a rather stringent regulatory program.

Monitoring Program Review

Illinois has a statewide ground water monitoring network, including a subnetwork of 30 stations which monitors community water supply wells in predominantly agricultural watersheds for pesticides six times a year. Pesticide monitoring targeted areas where reliance on ground water was heavy, pesticides were being used or stored, and susceptibility to contamination was high.

The state established a program to monitor surface water supplies for pesticides in 1973. Twelve pesticides are monitored annually at each surface water public water supply. As of October 1987, none of these 12 pesticides have been found in concentrations exceeding EPA-set maximum allowable concentrations.

In the fall of 1985 and spring of 1986, almost 400 wells were sampled for 34 pesticides. Only 3 wells showed traces of pesticides, which included atrazine, metolachlor, alachlor, and metribuzin. These 3 wells were within 50-700 feet of agricultural chemical commercial operations.

Sampling in Washington County in Aug. and Sept. 1987 for 90 pesticides resulted in detections of atrazine, DDE, prometon, chlordane, metribuzin, heptachlor epoxide, dieldrin, and DDD. The pesticides were found in all of the surface water samples, 31% of the deep wells sampled, and 71% of the shallow wells. Of 24 samples, 54% tested positive for pesticides, 46% negative.

State ground water monitoring in the future will continue to include pesticide surveys. The state will sample 300 new community wells each year.

Regulatory Programs

Illinois has both numeric and narrative ground water standards. Numeric standards include those established by EPA for drinking water for the usual pesticides--2,4-D, endrin, lindane methoxychlor, toxaphene, and 2,4,5-TP silvex--plus additional standards for aldrin, chlordane, DDT, dieldrin, heptachlor,

heptachlor epoxide, and parathion. The narrative standards, as they may apply to pesticides, state that water is to be free of matter of other than natural origin in concentrations harmful to human, animal, plant, or aquatic life.

The Illinois Ground Water Protection Act established an Interagency Coordinating Committee on Ground Water composed of 10 state agency heads and chaired by the Illinois Environmental Protection Agency {IEPA}. The committee will review and evaluate the state's ground water protection policy and recommend new legislation and regulations. The Department of Energy and Natural Resources {DENR} was charged with developing a data collection and ground water monitoring program, with special attention paid to assessing the impact of agricultural chemicals on ground water.

The Act provides for statewide mapping of aquifers and recharge areas by DENR, which will aid IEPA in establishing priority ground water protection planning regions. It provides for well site surveys by IEPA and protection needs assessments by local governments, as well requiring regulation of activities that may pollute ground water such as storage of pesticides. The act also establishes minimum setback zones {200 or 400 feet} for sources or potential sources of contamination and allows for expansion to maximum setbacks of 1000 feet to prevent contamination of community wells. Sites certified by IEPA as posing minimum hazards may be exempted from the setback requirements. Finally, the law requires the contaminator of a well to provide the well owner with an alternative drinking water source or treatment to render the water potable.

The Illinois Department of Agriculture is the lead agency for FIFRA enforcement; its Bureau of Plant and Apiary Protection administers FIFRA enforcement and certification and training programs.

The Illinois Pesticide Act authorizes the Department to register and collect fees for pesticides used or sold in the state, and to regulate the labeling, use, and application of pesticides. Commercial applicators and users of restricted use pesticides must be certified and licensed, with recertification required every five years. The state conducts training programs for commercial and private applicators in concert with the Cooperative Extension Service. Legislation passed in 1985 established a Pesticide Control Fund comprised of registration and license fees to finance public education programs on the proper use of pesticides.

The pesticide act also provided for an Interagency Committee on Pesticides and assigned it responsibility to advise on how to protect human health and the environment given the use of pesticides. The committee's basic tasks are: {1} to review the status of the sale and use of pesticides; {2} to review, advise, and approve pesticide programs directed by government agencies or applied to state-owned land; {3} to consider the problems of using pesticides; and (4) to recommend legislation concerning pesticides.

Another state law which regulates pesticide activities is the Illinois Environmental Protection Act. This law requires a permit for the application of any aquatic pesticide to water within 20 miles upstream of a public water supply intake. In addition, it mandates provision of secondary containment to prevent contamination from a spill of agrichemical products. Solid waste regulations under the law allow the disposal of pesticide containers that have been triple-rinsed in a licensed sanitary landfill that accepts general refuse.

The Illinois Department of Transportation regulates the storage and transport of pesticides, in order to reduce the chance of accidental, negligent, or intentional releases. Any person who stores or transports a pesticide listed on the Illinois Regulated Chemical List must register with the Department or with the Commerce Commission.

An advisory committee of industry and university specialists are promulgating design and operating standards for agrichemical storage and handling facilities. The emphasis is on constructing secondary containment structures and wastewater management systems that will minimize the off-site effects of large-scale and incidental spills and runoff of agrichemicals.

Other Activities

The Illinois Farm Bureau has conducted pesticide can recycling campaigns and educational efforts in the safe handling and triple-rinsing of containers.

Southern Illinois University researchers, with state support, are studying the degradation rates of a simulated pesticide rinsewater solution in their trickling filter system, and will formulate design criteria for a commercial-scale pesticide rinsewater treatment system.

The state has a number of programs which encourage the voluntary adoption of best management practices (BMPs) and lend technical and financial assistance to applicators in using BMPs.

The Cooperative Extension Service coordinates an extensive IPM program in Illinois. Specialists in agronomy, entomology, and plant pathology conduct annual workshops to educate growers and train crop consultants. In 1985, these consultants monitored 324,000 acres of cropland and advised 843 growers.

Illinois is preparing an assessment report and a management report on nonpoint source pollution. The two reports will discuss state efforts to reduce pesticide contamination of water and are scheduled for completion by August, 1988.

STATE PESTICIDE CONTROL ACTIVITIES: INDIANA

Indiana has completed and accepted both a ground water protection strategy and an implementation plan for FY 1988.

Technical assistance from EPA included DRASTIC and wellhead protection seminars, a Grand Calumet River study, and technical documentation.

Monitoring Program Review

No data.

Regulatory Programs

Indiana has narrative ground water quality standards and an interagency committee is developing numeric standards which will be integrated with current surface water policies.

Other Activities

Indiana has identified vulnerable public water supplies.

A 1987 study identified priority ground water areas in the state.

The state has conducted a pilot wellhead protection area study.

STATE PESTICIDE CONTROL ACTIVITIES: MICHIGAN

Michigan is revising the 1984 ground water protection initiatives to more closely resemble EPA's strategy requirements.

EPA provided the state with technical assistance on an Upper Great Lakes Connecting Channels Study and assisted with seminars on wellhead protection and DRASTIC.

Monitoring Program Review

The state has done limited sampling in response to pesticide contamination incidents.

Regulatory Programs

Michigan has narrative ground water quality standards which state that no one is to discharge into the ground water any substance that is or may become injurious to the public health, safety, or welfare or to the domestic, commercial, industrial, agricultural, recreational, or other uses that are being made or may be made of the ground water.

The state uses a permit program to protect ground water.

Other Activities

Michigan is working to integrate the state ground water data base with local health department activities.

The state has been successful in using integrated pest management {IPM} to control major insect pests; IPM has increased farmers' profits between 16 and 46%.

STATE PESTICIDE CONTROL ACTIVITIES: MINNESOTA

Minnesota has a draft ground water protection strategy; the final strategy may be completed by the end of FY 1988. The state primarily uses pesticide use and disposal regulations to manage pesticide activities.

EPA provided Minnesota with technical documents, and conducted wellhead protection and DRASTIC seminars.

Monitoring Program Review

The Minnesota Departments of Health and Agriculture conducted recent pesticide monitoring surveys of over 700 public and private drinking water wells located generally in agricultural areas. Also included were observation wells located in or near agricultural fields receiving pesticide applications. The 30 pesticides selected for testing were those commonly used in the state and/or likely to contaminate ground water and threaten public health.

As of October, 1986, one or more pesticides were detected in 38% of the 500 wells sampled--14 pesticides overall. Atrazine was the most common, found in 35% of the wells sampled while alachlor--the next most common--was found in 5%. The other 12 pesticides were detected in less than 2% of the wells tested. With one exception, all the pesticide concentrations were below the state Department of Health's recommended drinking water limits. The exception--a high aldicarb level--was found in a non-drinking water well. As expected, pesticides in the ground water were more prevalent in the hydrogeologically sensitive areas of the state--the karst areas in southeastern Minnesota and the shallow sand and gravel aquifer areas in central and west-central Minnesota.

Results of the survey will be examined along with pesticide use histories obtained from farmers and pesticide dealers or applicators to determine the relationship between site-specific applications and pesticide occurrence in nearby wells.

Regulatory Programs

Minnesota has both numeric and narrative ground water quality standards, but none of the numeric standards apply to pesticides. Narrative standards state that toxic pollutants, presumably including pesticides, are not to be discharged or deposited in any manner that will endanger the quality or uses of the underground water.

A 1987 law authorizes metropolitan counties to prepare ground water plans, sets standards for these plans, and requires that each plan be reviewed by local authorities, the Metropolitan Council, and certain state agencies.

each plan be reviewed by local authorities, the Metropolitan Council, and certain state agencies.

An earlier state law authorizes the formation of watershed districts in order to protect ground water quality.

A 1987 pesticide law authorizes the Commissioner of Agriculture to develop and administer state regulations relating to pesticides. The commissioner must determine the impact of pesticides on ground and surface water and develop standards for pesticide management. The law sets standards in the following areas: (1) sale, use, and storage of pesticides; (2) posting of warning signs when a pesticide has been used; (3) licensing of pesticide applicators; (4) recordkeeping and liability requirements for pesticide activities; (5) corrective action when a pesticide is released into the environment; and (6) enforcement and penalties for violations of pesticide laws.

The act also requires registration of all pesticides used or distributed in the state. Moreover, it requires that an applicator of pesticides through an irrigation system (i.e., chemigation) obtain a permit from the commissioner. Finally, the act mandates that the commissioner and the Pollution Control Agency work together to develop a pesticide container deposit and return program for certain pesticide containers.

Minnesota has a ground water "superfund" to clean up or replace contaminated drinking water supplies.

Other Activities

In the Garvin Brook area of the state, watershed land owners have signed contracts to implement best management practices.

The state is implementing an integrated ground water information system, expected to come online in FY 1989. Minnesota has also developed a process for delineating priority ground water areas.

STATE PESTICIDE CONTROL ACTIVITIES: OHIO

The state is considering revising its 1986 ground water protection strategy.

Monitoring Program Review

No data.

Regulatory Programs

Ohio has designated two sole-source aquifers and more designations are planned.

The state has narrative standards for ground water quality, and its classification system scheduled for completion in FY 1988 includes an option for selecting numeric standards.

Other Activities

No data.

STATE PESTICIDE CONTROL ACTIVITIES: WISCONSIN

Wisconsin has an active ground water protection program and is in the process of developing a formal ground water protection strategy. The state emphasizes a regulatory approach based on water quality standards and supported by monitoring and a strong information and education program. Wisconsin does not rely on ground water classification and differential protection; all ground water, including current sources of drinking water, receives essentially equal concern and protection. Since the mid-1970s, Wisconsin has followed a general policy of protecting its ground water from "significant damaging impacts" to present and future non-consumptive uses.

Monitoring Program Review

The state Department of Natural Resources (DNR), in cooperation with other agencies and the Ground Water Coordinating Council, manages the ground water monitoring program. Types of monitoring conducted include problem assessment monitoring, regulatory monitoring, at-rest monitoring, management practice monitoring, and monitoring plan development.

Since 1981, DNR has monitored ground water for aldicarb, primarily focusing on drinking water wells in areas thought to be most vulnerable to contamination. Through 1987, over 1,500 wells had been tested. Aldicarb residues exceeding 10 ppb were detected in slightly less than 10% of these wells. Rhone-Poulenc Ag Company (formerly Union Carbide), the product manufacturer, performed most of the sample analyses. Pesticide manufacturers have paid for virtually the entire aldicarb monitoring program.

In 1985, the Department of Agriculture, Trade and Consumer Protection (DATCP) began monitoring sites in highly susceptible ground water areas for aldicarb and other pesticides. Samples taken at some of these sites detected aldicarb at levels above the state's enforcement standard of 10 ppb. These incidences of contamination were apparently due to normal agricultural use. Alachlor, atrazine, metolachlor, metribuzin, picloram, and linuron were also found at one or more sites, at generally low levels. State officials suspect that the higher readings for alachlor and atrazine may be associated with spills or back-siphoning incidents.

Regulatory Programs

Wisconsin has both numeric and narrative ground water quality standards. Numeric standards for pesticides are often more stringent than federal standards. The state has numeric standards for 2,4-D, endrin, lindane, methoxychlor, toxaphene, 2,4,5-TP silvex, aldicarb, carbofuran, dinoseb, and simazine, and will add 14 pending standards to the list, including standards for alachlor and atrazine.

The state's Groundwater Law, passed in 1983, required a two-tiered system of numerical standards for contaminants in ground water. The standards consist of an enforcement standard and preventive action limit {PAL} for each substance, including pesticides. Enforcement standards are concentration levels that cannot be legally exceeded. If a substance is found in ground water in a concentration that exceeds the enforcement standard, the state agency which regulates the activity that caused the contamination must respond to secure compliance with the standard. The response may include prohibiting the activity. PALs are either 10, 20, or 50% of the enforcement standard depending on the degree of risk posed by the substance. PALs serve as early warnings indicating that deterioration of ground water quality is occurring. Actions may be necessary to ensure that an enforcement standard is not exceeded.

In the case of pesticides, the Department of Health and Social Services {DHSS} develops and proposes health-based ground water standards, the Department of Natural Resources {DNR} takes the proposed standards to public hearings and may ultimately adopt them as official standards, and DATCP promulgates pesticide use regulations to maintain compliance with the standards. DHSS may also issue drinking water health advisories {HAs} when new data indicate that existing drinking water standards or advisories do not sufficiently protect human health. HAs are temporary and have no direct regulatory impact; they may, however, result in permanent changes in ground water standards.

Narrative standards declare that state regulatory agencies may act within their established programs to protect public health or to prevent significant damage to ground water or surface water quality for consumption or nonconsumption.

Wisconsin requires state registration for pesticides used, sold, or distributed in the state and charges an annual registration fee for each product.

A 1987 state law requires applicants for a license to sell or distribute pesticides to submit a report to DATCP listing every pesticide proposed for sale or distribution. License fees are deposited in the ground water fund. The law further requires dealers of restricted-use pesticides and commercial applicators to obtain licenses.

Since 1983, Wisconsin has placed label restrictions on the rate and timing of applications of aldicarb, and has mandated one-mile aldicarb use moratorium areas where levels in ground water have exceeded the enforcement standard. It has also required persons intending to use aldicarb to report to DATCP. DATCP must deny any permit for the application of aldicarb-containing products in prohibited areas unless it determines that concentrations have been below the enforcement standard for at least two years and its use would not cause the standard to be exceeded. A 1987 aldicarb emergency rule added a site evaluation requirement to the regulations to prohibit its use on fields evaluated as highly susceptible to ground water contamination. This site evaluation requirement may be applied to other pesticides, along with modifications in use practices, where appropriate.

DATCP has appointed the Committee on the Regulation of Pesticides and Nitrates, which includes state legislators, to assess the state's experience in regulating agricultural chemicals and to make appropriate policy recommendations.

A financial compensation law authorizes municipalities to apply to DNR for grants to cover up to 60% of the costs of replacing private contaminated underground drinking water supplies. This fund is currently broke and a bill is before the legislature to replenish it.

Other Activities

Wisconsin is interested in putting greater emphasis on management practices to reduce or prevent pesticide contamination of ground water. These include integrated pest management {IPM}, improved pesticide handling, storage, application, and disposal practices, and crop management and cultural practices. A draft document summarizing research related to these practices was published in 1987 by the Environmental Resources of the University of Wisconsin-Extension, with partial funding by DNR.

A computer-generated ground water susceptibility map of the state, accompanied by a narrative report, will be produced in FY 1988.

DATCP's Agricultural Statistics Service conducts periodic surveys to estimate pesticide usage. The 1985 Pesticide Use Report provided information on pesticide use patterns as they relate to ground water regulatory activities. The Committee on the Regulation of Pesticides and Nitrates has recommended that information on pesticide use in Wisconsin be published as annual reports.

Wisconsin has promoted public education and information on ground water through radio and television spots, a teacher's guide for elementary schools, posters and other publications on ground water problems and how the state has dealt with them.

Region VI

Arkansas

Louisiana

New Mexico

Oklahoma

Texas

STATE PESTICIDE CONTROL ACTIVITIES: ARKANSAS

Arkansas completed its ground water protection strategy in the early 1980's. The state's ground water classification system reflects EPA's differential protection policy.

Monitoring Program Review

Monitoring is authorized by the Arkansas Water and Air Pollution Control Act. The state monitors for pesticides in ground water in one county and has found no pesticides to date. Its monitoring project is funded by EPA. It also monitors in response to complaints.

Regulatory Programs

At this time, Arkansas has neither numeric nor narrative ground water quality standards.

The Arkansas Water and Air Pollution Control Act authorizes the state to protect its ground water. The act gives broad protection to "waters of the state." It allows monitoring, ground water classification, and regulation of both ground and surface waters.

The Arkansas State Plant Board has pesticide misuse enforcement authority and responsibility for ensuring compliance with federal pesticide laws.

Other Activities

The state is developing a ground water information data base.

STATE PESTICIDE CONTROL ACTIVITIES: LOUISIANA

Louisiana's legislature has mandated completion of the state's ground water protection strategy by June 30, 1988. The framework of the strategy is built upon a report entitled: "Groundwater Protection in Louisiana: Problems and Options." Five state agencies deal with ground water issues and by law must integrate their efforts.

Monitoring Program Review

No data.

Regulatory Programs

Louisiana has narrative ground water protection standards. The Louisiana Water Control Law states that no person is to discharge or allow to be discharged into the water any {a} waste or other substance of any kind that will tend to cause water pollution in violation of any rule, order, or regulation or {b} substance the discharge of which violates any term, condition, or limit imposed by a permit. In addition, the law declares that no person is to discharge into any underground water of the state any hazardous waste as defined in the state statutes.

The state requires registration of pesticides, and any person who is reregistering a pesticide for which the label has been changed must submit the same type of information as required for the initial registration.

Another law created a pesticide fund to finance state pesticide programs and activities.

The state also has laws regarding well standards and well abandonment procedures.

Other Activities

Louisiana is currently developing a well head protection program.

PESTICIDE CONTROL ACTIVITIES: NEW MEXICO

The state will submit a final ground-water protection strategy by September of 1988. New Mexico has adopted a two-tiered ground water classification system. The strategy's overall goal is to protect all ground water with total dissolved solids concentrations of 10,000 mg/l or less for present and potential use as domestic and agricultural water supply.

The state does not know whether it has a problem with degradation of ground water by pesticides; it is currently testing for pesticides in selected areas.

Monitoring Program Review

The Department of Agriculture monitors for pesticides in areas of known or suspected problems. Ground water quality monitoring is also conducted by the state Environmental Improvement Division {EID} under several state and federal programs, and by the U.S. Geological Survey under federal and state funds. EID has investigated localized incidents of ground water contamination by pesticides in the Albuquerque South Valley--in the sediments of a flood-control channel and in shallow ground water adjacent to the channel. Small amounts of relatives of DDT and lindane were detected.

Most of the limited monitoring for pesticides in ground water done to date has been for the six pesticides covered under federal drinking water standards, and for fumigants such as EDB. None of those pesticides {except the small amount of lindane mentioned above} have been detected. The EID and the state Department of Agriculture are conducting a ground water testing program for carbamate pesticides {aldicarb, carbofuran, etc.}. The agencies are targeting heavy application areas located in shallow water table environments; the first samples will be taken from existing wells later this year.

In 1988, the 21 public water systems serving 10,000 or greater or greater population will begin monitoring for organic compounds, including pesticides. By 1991, all nontransient public water systems will monitor for these organic compounds.

Regulatory Programs

The state has numeric ground water quality standards, but these do not presently apply to pesticides. Its narrative standards apply to toxic pollutants on the list covered by the numeric standards.

New Mexico has a Pesticide Control Act, enacted in 1973 and amended in 1978. It requires product registration, authorizes use/misuse inspections, mandates the licensing of pesticide dealers, and regulates disposal. Regulations under the law are administered by the state Department of Agriculture. The state is holding off changing the law while Congress considers amending FIFRA.

Additional state legislative authority for pesticide control activities--specifically disposal or point source discharges--possibly includes: the Water Quality Act, the Hazardous Waste Act, the Emergency Management Act, and the Environmental Improvement Act.

The Water Quality Act is the basic authority for water quality management in New Mexico. The Act established the Water Quality Control Commission, which was charged with adopting a comprehensive water quality program. The major compenents of this program include a continuing planning process, a state water quality management plan, ground and surface water quality standards, ground water protection regulations, regulations for discharge to surface water, a cleanup regulation, and a regulation on disposal of refuse. The Commission delegates water quality management activities to state agencies, primarily to EID.

The Emergency Management Act gives the state legal authority to respond to emergency hazardous materials incidents. Under the Act, EID is authorized to respond to any incident which poses a threat to public health or which threatens the environment. A 24-hour hotline is manned by Division staff. During an incident, EID staff provide technical assistance, do monitoring when necessary, assist with and evaluate cleanup activities, and take appropriate enforcement action. Inadequate legislative funding, however, has hampered the Division's capacity to respond. In 1987, in an effort to improve the situation, a contract was signed with I.T. Corporation: the company will provide emergency response, materials analysis, and remediation. In addition, the Division is reorganizing and redefining its emergency response activities.

The state also has regulations that require that private wells be set back 100 feet and public wells 200 feet from any pollution source; although the regulations do not mention a pesticide source specifically, they would presumably apply to it. Currently, there is a proposal for making these set-backs greater. Moreover, the state has requirements for siting new wells in drinking water aquifers. These regulations focus on protecting aquifers for present or future use, whether or not the use if for a public water supply well; they meet some but not all requirements of the federal wellhead protection program.

Other Activities

No research is currently being done on low-input agriculture, although a university professor is interested in pursuing it.

New Mexico collects annual sales of restricted-use pesticides by licensed dealers to private applicators--by county. This information is voluntarily supplied to the state Departement of Agriculture; over 90% of the dealers participate.

During 1986-87, the EID and other agencies made substantial progress in developing computerized information systems for ground water quality data.

In 1985, a contractor for the City of Albuquerque conducted a week-long household hazardous waste collection project. The contractor accepted wastes--which probably included pesticides--packaged and shipped them to an approved disposal facility. The state hopes that such projects become a regular City program and become more common in other cities.

New Mexico has adopted a voluntary approach to nonpoint source pollution control; the Soil and Water Conservation Bureau is working with Soil and Water Conservation Districts to encourage the use of best management practices. Presently, the state is conducting an interagency nonpoint source assessment and will prepare a nonpoint source management program.

STATE PESTICIDE CONTROL ACTIVITIES: OKLAHOMA

Oklahoma's ground water protection strategy is in final draft form and will be forwarded to EPA Region VI for review. Seven state agencies have responsibilities for ground water protection. Oklahoma has a ground water classification system based on 10 beneficial use categories which have been applied to 21 aquifers. All ground waters will receive equal protection, with the exceptions that high priority drinking water sources will be monitored most often, while waters high in total dissolved solids will not be monitored as often as other waters.

The ground water protection strategy does not have a pesticide management plan per se as one of its components. The state Department of Agriculture {DOA}, however, is developing one. It will consist of a generic plan that will address all aspects of agricultural resources and specific plans--for example, a plan for ground and surface water protection from aldicarb--as attachments to the generic planning document. The DOA has completed the generic plan and will forward it to the Board of Agriculture for approval.

At this time, Oklahoma is not aware of any problem in the state with pesticide contamination of ground water.

Monitoring Program Review

The state Department of Health monitors public water supply sites with ground water sources every three years. Major aquifers are also monitored.

A ground water monitoring project completed in 1987 tested 77 alluvian terrace wells in selected agricultural areas for about 27 different pesticides and found nothing. Oklahoma will test for aldicarb in selected areas in 10 counties. To date, none has been detected in ground water in the state.

Oklahoma will also take soil samples in certain areas of the state and analyze the samples for pesticide residues.

Regulatory Programs

Oklahoma has both numeric and narrative ground water quality standards. Although it has no numeric standards for pesticides, as a matter of practice, the state will use EPA's drinking water standards; indeed, DOA's pesticide management plan--awaiting approval by the Board of Agriculture--recommends using EPA's maximum contaminant levels {MCLs} for pesticides. Under one proposal, any level of pesticides in ground water may trigger a regulatory response, such as requiring a best management practices {BMP} program to halt or reverse the source's contribution before it reaches a MCL.

The Oklahoma DOA has promulgated regulations under the authority of two state laws: a pesticide registration law and a pesticide applicators law. DOA registers pesticides for use, distribution, and sale in the state and may place restrictions on them. As of yet, DOA has not found it necessary to place restrictions on pesticides over and above the federal label restrictions with the exception of phenoxy herbicides, whose use it has constrained in certain areas of the state.

The DOA requires that commercial and non-commercial (e.g., applicators who spray right-of-ways for rural electric companies, etc.) applicators be certified and licensed. Private applicators of restricted use pesticides must also be certified. Dealers of restricted use pesticides must obtain a license to sell these and keep sales records for a minimum of two years. The Department conducts misuse investigation and enforcement.

In addition, DOA requires that all chemigation systems and pesticide tank loading facilities have functioning back-flow prevention devices. DOA has the authority to perform equipment inspections.

Other Activities

While Oklahoma does not have a complete integrated pest management (IPM) program, it is conducting IPM activities. Oklahoma State University does research on IPM and insect scouting. A set of IPM approaches is also included in DOA's pesticide management plan, as well as BMPs. The state already has legal authority to implement most of these approaches, although it may eventually have to go to the legislature for funding.

The generic pesticide management plan discusses possible funding sources for monitoring and remedial actions. The state will rely on government contingency funds until the state legislature addresses the issue. Some officials envision paying for monitoring and clean-up with revenue from a revolving fund, using EPA grants and state matching funds for start-up money and evolving toward a self-supporting program.

The state Cooperative Extension Service and the Oklahoma Conservation Commission, in cooperation with the U.S. Soil Conservation Service, conduct public education sessions on the protection of ground and surface water from pesticides.

Oklahoma has worked with the U.S. Geological Survey and the Oklahoma Geological Survey to develop four functioning Geographic Information Systems, with data on hydrogeological characteristics, ground water vulnerability, location of aquifers and recharge areas, etc. It is presently studying how to integrate these data bases.

STATE PESTICIDE CONTROL ACTIVITIES: TEXAS

Texas has submitted its 1988 ground water protection strategy to EPA for review and comment. The strategy promotes nondegradation of ground water targeted for beneficial uses, and stresses local/regional participation in ground water protection programs.

Texas is drafting a pesticide management strategy, which will probably follow EPA's proposed pesticide strategy. The Texas Water Commission will be the lead agency in drafting the strategy. The state will also include a pesticide management component in its nonpoint source management plan.

Monitoring Program Review

The Texas Department of Agriculture (TDA) is testing ground water for pesticides in several crop-producing regions of the state. These regions include Howard, Martin, Haskell, Knox, Comanche, Dawson, Terry, and Lynn counties. The effort involves TDA's Pesticide Evaluation Program, Office of Natural Resources, Field Operations offices and Pesticide Laboratories. The Texas Water Development Board is providing technical assistance with water sampling.

In the summer of 1987, TDA sampled 75 wells, 25 each in Haskell, Knox, and Commanche counties--a region of significant agricultural production, chemical use, and shallow domestic wells. Pesticides were detected in five wells. Resampling revealed pesticides in four of the five wells, at the following concentrations: prometon (26.4 and 7.1 ppb), atrazine (5.3 ppb), 2,4,5-T (2.9 ppb), and metolachlor (5.5 ppb).

The next phase of the monitoring project will occur in El Paso County in highly permeable soil along the Rio Grande River and in portions of Terry, Lynn, and Dawson counties in a region of high cotton production. Other regions potentially vulnerable to ground water contamination by pesticides will be sampled at a later date. Samples will be tested for 82 pesticides as well as for nitrates, arsenic, and other inorganic chemicals.

In 1984 in West Texas, arsenic was found in concentrations exceeding federal drinking water standards in 34 out of 101 wells tested in Howard and Martin counties, not far from Big Spring. TDA warned well owners of possible health threats and suggested they switch to alternative drinking water supplies. The agency plans to resample the 34 contaminated wells during the spring of 1988, to determine how the arsenic levels may have changed over time.

Regulatory Programs

Texas is discussing the possible use of numeric ground water quality standards. It is currently using numeric standards in some programs to assist best professional judgement in determing if contamination has occurred and to what level of quality ground water can be practically treated. The state has not yet resolved the issue of whether it should set a fixed policy of using numeric standards.

State law requires the Texas Water Commission to monitor the state's ground water and to identify geographic areas where ground water quality problems may exist or may occur.

An informal ground water classification system has been used by Texas regulatory agencies for years in seeking to implement the goal of nondegradation of usable-quality ground water. During FY 1988, the Groundwater Technical Advisory Group, made up of representatives from the Water Development Board, the Health Department, the Water Commission, and Texas A&M will increase consideration given to issues related to ground water classification and will help select geographical areas to target for study.

TDA investigates and enforces label violations, and ensures compliance with federal and state pesticide laws and regulations. It also reviews pesticides during the registration process when they may pose problems specific to Texas. TDA may also restrict the use of pesticides which present unreasonable risks to humans or the environment, taking into account the economic, social, and environmental costs and benefits of the use of the pesticide. The agency has issued restrictions and advisories for several pesticides.

TDA and the Texas Water Commission have concurrent responsibility for regulating the storage and disposal of pesticide wastes produced by agricultural operations. The Texas Water Code and the Texas Solid Waste Disposal Act give the Water Commission the authority to regulate pesticide wastes, including those that result from storage, mixing, and application. The Structural Pest Control Board, in addition to TDA, regulates urban pesticide use.

The state requires aerial applicators to monitor their waste disposal pits; the Texas Water Commission reviews the monitoring reports.

Other Activities

During certain well-monitoring surveys, the state will collect information on well construction, well setting, conditions around the well and soil factors. Agricultural practices that might result in contamination of ground water will be examined. This data will help regulatory agencies make decisions to, for example, restrict the use of pesticides, and in developing best management practices.

The state has successively used integrated pest management {IPM} to control the boll weevil. The program is based on a new type of cotton that develops quickly and can be harvested before the boll weevil causes serious damage. It also involves the use of a pesticide--and timing of its applications--that poses minimum threat to the predators of the boll weevil.

The Texas State Soil and Water Conservation Board {TSSWCB} has non-regulatory responsibilities to manage agricultural chemicals. In addition to technical assistance in IPM, the TSSWCB provides farmers with information and assistance on the proper use of agricultural chemicals. The Texas Agricultural Extension Service also conducts non-regulatory activities, including a statewide educational program that provides technical information to farmers on the proper selection and use of pesticides, and field demonstrations which generate local information on the results of pesticide applications.

Texas will continue to conduct wellhead demonstration projects through FY 1988. The Texas Water Commission and the state Health Department, along with other state agencies, are working toward establishing a voluntary wellhead protection program as a primary component of the nonpoint source management plan.

Texas has completed DRASTIC mapping of all counties across the state; it expects to publish the maps in early 1989.

Finally, the Texas Water Commission conducts seminars on ground water protection that include discussions on pesticides and the potential problems they pose for ground water.

Region VII

Iowa

Kansas

Missouri

Nebraska

STATE PESTICIDE CONTROL ACTIVITIES: IOWA

Iowa has adopted a final ground water protection strategy. The basis of its strategy is the Iowa Groundwater Protection Act of 1985. In 1987, Iowa passed a new Groundwater Protection Act. The state's general policy as it relates to pesticides is to prevent the contamination of ground water by changing the behavior of persons who use pesticides, primarily through a strong education and research effort. Its goal is nondegradation of ground water for beneficial uses.

Monitoring Program Review

Iowa's public water supplies are monitored at least once every three years. This includes 816 ground water-based systems which serve over 50% of the state's population. Sampling is also routinely conducted at Big Springs in cooperation with the Iowa Geological Survey, the University Hygienic Lab, and the Conservation Commission.

In 1985, the Iowa Department of Water, Air, and Waste Management sampled 25 wells which served 12 public water supplies. The wells, located along the Little Sioux River in northwestern Iowa, were tested for 35 commonly used pesticides. Nine wells, or 36% of those sampled, were found to have low levels of several pesticides: alachlor, atrazine, cyanazine, metolachlor, metribuzin, and terbufos.

A recent monitoring study, whose results were published in 1987, tested 33 community drinking water supplies for 37 pesticides. Trace amounts of one or more pesticides were found in 30 of the 33 systems, despite the fact that this water had been cycled through water treatment facilities. These pesticides included alachlor, atrazine, metolachlor, trifluralin, and 2,4-D. Seventeen of the 33 systems tested for alachlor exceeded EPA's accepted cancer risk level for children while seven exceeded the accepted risk level for adults. In sampling, the state Department of Natural Resources and the University of Iowa Hygienic Lab sought a worst-case scenario in collecting the samples after spring rains, when runoff of pesticides into nearby streams and lakes would be at their highest.

Iowa has instituted a survey of treated water supplies from each of the state's 904 incorporated municipalities, which represent 75% of its population. Measurements include 14 herbicides and 20 insecticides. The National Cancer Institute is sponsoring a survey of treated water supplies from all Iowa communities of over 1,000 persons. This data, along with historical and questionnaire data on specifics of water source and treatment, and cancer and birth defects data, will be placed in a data base called ORACLE.

Regulatory Programs

At this time, Iowa has neither numeric nor narrative ground water quality standards. Public hearings are being held, however, to address the question of adopting them.

The 1987 Groundwater Protection Act establishes a program of research, education, and demonstration projects to address ground water contamination problems caused by agricultural chemicals and other sources. It sets up a Groundwater Protection Fund comprised of user fees on products and discharges that contribute to contamination. The agriculture management account of this fund is comprised of pesticide dealer fees {one-fifth of 1% of gross annual sales in Iowa}, manufacturers' pesticide product registration fees {one-tenth of 1% of gross annual sales}, and a nitrogen fertilizer tax.

The revenue from the agricultural fund account will finance related ground water protection programs administered primarily by the Department of Agriculture and Land Stewardship {DALS} and the Department of Natural Resources {DNR}. In regard to its pesticide-related activities, DNR is responsible for developing a comprehensive ground water monitoring network and data collection program, completing a ground water hazard mapping of the state, and registering agricultural drainage wells.

Owners of agricultural drainage wells are required to register the wells with DNR and develop a plan to eliminate ground water contamination from the wells. No new wells can be constructed and existing systems cannot be rebuilt. If drainage wells have to be substantially modified or closed due to contamination, well owners may receive financial assistance from the state. Funds may also be available to purchase wetlands or conservation easements on or around wetlands that result from drainage well closures.

Other Activities

The 1987 ground water act created the Center for Health Effects of Environmental Contamination {CHEEC} at the University of Iowa. CHEEC is designing a project to test the hypothesis that women who have consumed water from contaminated supplies during pregnancy are at increased risk for adverse pregnancy outcomes.

Iowa has received EPA regional support to study the fate and transport of agricultural chemicals at Big Springs, for alluvial aquifer studies, ground water quality studies, vulnerability mapping, and for agricultural drainage well studies.

DALS is required to promote the use of best management practices in order to lessen ground water contamination by agricultural chemicals and to conserve the soil. The Private Pesticide Applicator Training Program conducted by the Iowa State University Cooperative Extension Service will educate over 60,000 Iowa farmers in

1988-89 on environmental and personal safety when applying fertilizer and restricted use pesticides. The program also covers nonchemical methods to control weed and insect pests. By passing an examination on the material, farmers become certified to apply restricted use pesticides for a three-year period. Extension personnel will conduct from 300 to 600 training sessions each year. The program is financed by DALS and the Cooperative Extension Service/USDA. DALS charges a $5 fee for the certification examination. About 60% of Iowa farmers are currently certified as private applicators and this percentage is expected to rise as EPA EPA classifies more pesticides as "restricted use."

The new ground water law also established the Leopold Center for Sustainable Agriculture at Iowa State University. The center's charge is to conduct research and educational programs on sustainable agriculture. The Iowa Legislature allocated $800,000 to the center for applied research and demonstration projects. Project proposals include identification and reduction of negative environmental and socio-economic impacts of current agricultural practices, development and testing of alternative farming practices, and improvement in educational programs to inform the agricultural community and the general public about sustainable agriculture.

In 1986, DALS initiated the Integrated Farm Management Program {IFMP} of the Agricultural Energy Management Advisory Council {AEMAC}. The program demonstrates and promotes the adoption of integrated farm management practices which, among other things, reduce the nonpoint source pollution of surface and ground water, and bolster the efficiency and profitability of agricultural production. More than 300 demonstrations have been conducted statewide; they show reduction in chemical fertilizer-nutrient waste and pesticide use, and how environmental protection is attained through reduction in chemical runoff to surface waters and by reducing leaching losses of chemicals into ground water. In addition, the integration of nutrient and chemical management with conservation tillage, land treatment, and cropping sequences.

The University of Iowa Department of Urban and Regional Planning and Iowa State University Cooperative Extension Service are evaluating the effectiveness of the demonstration program and examining changes in attitudes toward alternative farming practices. The University of Northern Iowa is participating in the program by developing teacher education materials which teachers will use to describe energy and environmental effects of farm management practices to students.

The Geological Survey Bureau, an arm of DNR, in cooperation with USGS, maintains a computer file on water quality data and has published documents describing the principal aquifers of the state and potential areas of contamination.

Kansas, Missouri, and Nebraska were lost from a disk while printing. Prior to that, copies were sent via E-mail to Susan Ray of EPA Region VII. She will mail paper copies of the summaries to OPP.

Region VIII

Colorado

Montana

North Dakota

South Dakota

Utah

Wyoming

STATE PESTICIDE CONTROL ACTIVITIES: COLORADO

Colorado adopted a ground water protection strategy in 1984. In 1987, it established a ground water classification system and ground water quality standards; it is currently promulgating the regulations to implement and enforce these. The goal of the strategy as expressed by the state Water Quality Control Commission is to "provide the maximum beneficial use of ground water resources, while assuring safety of the users by preventing or controlling those activities which have the potential to impair existing or future beneficial uses of ground water or to adversely affect the public health."

The Colorado Department of Health developed the strategy, with the help of an advisory committee of representatives from business and industry, the League of Women Voters, and the Bar Association. In 1985, 14 state agencies signed a Memorandum of Agreement to use the strategy if they encounter ground water problems.

The state does not know at this time the scope and magnitude of ground water pollution by pesticides.

Monitoring Program Review

No data.

Regulatory Programs

Colorado has both numeric and narrative ground water quality standards. It has adopted the federal drinking water standards for 2,4-D, endrin, lindane, methoxychlor, toxaphene, and 2,4,5-TP silvex, in addition to a strict standard for chlordane.

The narrative standards potentially apply to contamination from certain pesticides since they prohibit pollutants that are not listed in the numeric standards and that alone or in combination with other substances are in concentrations either {a} carcinogenic, mutagenic, teratogenic, or toxic to humans or {b} dangerous to the public health, safety, welfare or {c} both.

Colorada uses a broad ground water classification system tied to beneficial use and based on the level of total dissolved solids {TDS} in the water. There are three beneficial use categories: Use Category 1--ground waters with a TDS of less than 3000 ppm, suitable for all beneficial uses including public and private water supplies, irrigation, livestock and wildlife, and commercial/industrial purposes; Use Category 2--a TDS value of 3,000 to 10,000, suitable, though not ideal, for most beneficial uses and; Use Category 3--a TDS greater than 10,000, generally unsuitable for most beneficial uses other than some commercial/industrial uses.

In 1987, the state established the Colorado Pesticide Fund, comprised of fees collected under the state's pesticide laws. The Colorado Legislature has the authority to appropriate annual revenues from the fund to the state Department of Agriculture {DOA} to defray the costs of administering the pesticide program.

After January 1, 1990, state law requires that persons using chemigation obtain a permit. DOA must promulgate regulations governing the installation and use of chemigation equipment, the setting of permit fees, and the establishment of criteria for investigation of compliance. The law also lists mandatory devices for chemigation equipment, including an anti-siphoning valve, an automatic low-pressure drain, and a simultaneous interlock device. Moreover, it requires biennial inspections {at a minimum} of chemgation systems and empowers DOA to revoke a permit if use of a system results in ground water contamination.

The use or application of pesticides is not currently subject to the Water Quality Act, the primary statutory authority for ground water quality regulations. Colorado believes that further study to determine the scope and magnitude of degradation of ground water quality from applications of pesticides is necessary before any determination can be made on the appropriateness of subjecting this activity to ground water quality control requirements. It will be required to meet performance standards now under development, to ensure protection of ground water in use categories 1 and 2.

Other Activities

With EPA and U.S. Geological Survey assistance, the state is developing a Geographic Information Systems data base, and has also participated in a wellhead protection pilot project.

STATE PESTICIDE CONTROL ACTIVITIES: MONTANA

Montana adopted a limited ground water protection strategy in 1985. The state has a differential protection approach based on a ground water classification system tied to existing or designated beneficial uses. The classification system, as well as a permit system, is currently being implemented. Several state agencies share responsibility for the strategy's implementation. The state anticipates specific legislative action on a pesticide ground water strategy in fiscal year 1990.

Monitoring Program Review

In general, the state monitors for pesticides in response to suspected problems. Areas targeted for monitoring include: irrigated, loose soils; shallow aquifers; areas of heavy agricultural activity and; areas where spills are likely. To date, 11 pesticides have been found in 21 of 78 wells tested in the state. These 78 wells have been tested 2 to 3 times since 1984. Only in one case did the pesticides exceed the health advisory.

Recently, in response to a complaint, the state collected samples from three wells in Clancy in southwestern Montana. Samples from one well had trace amounts of picloram, while samples taken from the other two had 15 ppb and 28 ppb, respectively. These levels of picloram are far lower than the health advisories for this pesticide. The state Department of Agriculture (DOA) will resample the wells to confirm the preliminary results of the analyses. Samples for vegetation and soil have also been collected for analysis for picloram and 2,4-D. The results of this analysis are still pending.

Trace amounts of MCPA, 2,4-D, phenoxy herbicides, and dicamba have also been found in ground water.

Regulatory Programs

Montana has both numeric and narrative ground water quality standards. The Department of Health and Environmental Sciences (DHES) has adopted the federal drinking water standards for 2,4-D, endrin, lindane, methoxychlor, toxaphene, and 2,4,5TP silvex.

DHES narrative standards state that concentrations of dissolved or suspended substances other than those identified specifcally in the list of drinking water standards must not exceed levels that render the water harmful or detrimental to public health. Minimum allowable concentrations of these substances also must not exceed acute or chronic problem levels that would adversely impact existing or designated beneficial uses of a classification.

The DOA under the Montana Pesticide Act is responsible for managing the use, sale, handling, and disposal of pesticides.

The DHES, Solid and Hazardous Waste Bureau is the primary agency responsible for the correct disposal of pesticides and pesticide containers. The DOA has restricted the sale and use of all aquatic herbicides to certified aquatic herbicide applicators only. These applicators are trained and tested specifically on the use of aquatic herbicides. The DHES may require persons to clean up an aquifer on a case by case basis.

The DOA conducts misuse investigations and can assess civil penalties and other disciplinary actions such as suspension or revocation of licenses and permits.

Finally, the DHES is developing a wellhead protection program.

Other Activities

The DOA has conducted IPM programs in the past for some commodity groups such as alfalfa seed, certified seed potatoes, mint, and lentils. Currently, the Montana Cooperative Extension Service is conducting an Integrated Crop/Pest Management program for small grain growers in the state.

DOA has also contracted to collect hydrogeological data on ground water areas vulnerable to contamination by agricultural chemicals, and to conduct an aquifer sensitivity/vulnerability study.

Training materials for certification of applicators include information on pesticides/ground water issues and the proper disposal of used pesticide containers.

STATE PESTICIDE CONTROL ACTIVITIES: NORTH DAKOTA

North Dakota has developed a ground water protection strategy which includes an in-depth analysis of current ground water protection programs and recommendations to improve them. Public comments are currently being incorporated into the strategy document. The state legislature is discussing a proposal to establish a two-tiered ground water classification system.

The state's ground water protection strategy recognizes the possible threat that pesticides pose to ground water and recommends an increase in monitoring for pesticides and the development of ground water vulnerability maps for use by applicators.

Monitoring Program Review

Recently, North Dakota initiated a statewide monitoring program of over 400 public drinking water systems. It is analyzing a sample from each system for 21 different pesticides, selected on the basis of the chemical's use, solubility, mobility, and persistence. The program is being conducted by the state Department of Health and Consolidated Laboratories {DHCL}.

In the past, the state has conducted monitoring for pesticides in response to a suspected problem. It has detected picloram in some samples from ground water at levels exceeding 4 micrograms per liter.

Regulatory Programs

North Dakota has neither numeric nor narrative ground water quality standards at this time.

Under the authority of the North Dakota Pesticide Act, the state Department of Agriculture {DOA} enforces labeling requirements and the use of pesticides in the state. The Act also created a pesticide control board.

North Dakota has a regulation which requires any person alleging damage to his property from another's pesticide use to submit a loss report to DOA as a condition for bringing a civil action against the applicator.

The DOA has adopted rules regulating the practice of chemigation. The rules include standards for the design, installation, use and maintenance of chemigation equipment, and for the application of pesticides and fertilizers through irrigation systems. Special emphasis was placed on chemical injection port location, backflow prevention in the chemical lines and, most importantly, allowing for an anti-siphon device. The Department has the authority to make periodical inspections of chemigation equipment and operations.

Other Activities

The DOA initiated the development of ground water vulnerability maps with the North Dakota Weed Control Association, Dow Chemical Company, and DHCL participating.

DOA, working closely with North Dakota State Extension Service, conducts seminars for training of restricted use pesticides dealers and custom applicators. The Department also monitors the extension service training meetings for private producers. The Department has stressed the need for greater education and enforcement of the private sector.

In addition, the Department has updated the list of approved landfills for triple-rinsed chemical containers. The Commissioner of Agriculture declared the week of May 22 as "Pesticide Awareness Week". This was done to alert the public on the safe use and disposal of containers in order to protect ground water and the environment.

STATE PESTICIDE CONTROL ACTIVITIES: SOUTH DAKOTA

South Dakota adopted a ground water protection strategy in 1987. The general goal of the strategy is to ensure that ground water quality is maintained, improved, or allowed to change to a point not below that of the present level of water quality or drinking water standards, whichever is lower. Specific objectives include: to maintain existing water quality for present and future beneficial uses; to prevent contamination; to correct ground water pollution incidents and; to closely control the degradation associated with economic and social necessity.

The South Dakota Department of Water and Natural Resources {DWNR} is the primary state agency that conducts ground water quality activities. Within DWNR, the Division of Environmental Quality {DEQ} is responsible for enforcing the ground water protection program, while the Office of Water Quality within DEQ is primarily responsible for ground water quality protection activities. These include ground water quality standards, discharge permits, wellhead protection, spill reporting, investigation and enforcement, and monitoring cleanup.

DWNR and the state Department of Agriculture {DOA} will coordinate efforts to control pesticide releases to the environment. The state legislature is funding a pilot study to assess potential impacts of the application of agricultural chemicals.

Monitoring Program Review

DWNR conducts monitoring of known or suspected pollution sources, including sites near agricultural chemical facilities. Monitoring for pesticides is generally done in response to suspected problems. The ground water protection strategy recommends testing for pesticides the approximately 70 public water systems identified as vulnerable to contamination for pesticides and, in addition, sampling selected wells in shallow aquifers for pesticides.

Regulatory Programs

South Dakota has both numeric and narrative ground water quality standards. The standards are based on a classification system of two classes: ground water that is less than or equal to 10,000 mg/l total dissolved solids {TDS} and ground water greater than 10,000 mg/l. The standards protect the former for the beneficial use of drinking water supplies, suitable for human consumption. Numeric drinking water standards and narrative standards for potentially toxic pollutants are used.

The state DOA has pesticide misuse investigation and enforcement authority. DOA developed new pesticide facility design requirements that will reduce the potential for ground water contamination; these went into effect in 1987. The Department also requires the licensing of aerial pesticide applicators.

A 1987 law gave DWNR the authority to administer a wellhead protection program. Development of the program has begun; preliminary work to identify areas of influence and potential pollution sources near public water supply wells has been completed.

The state legislature recently passed a bill to establish funds to cleanup abandoned agricultural chemical contamination sites.

Other Activities

South Dakota has the following data bases of ground water information: the Ground Water Site Inventory (public, irrigation, and observation wells), the South Dakota DWNR Information System (ground water quality and water level data), the DWNR Office of Drinking Water system on public supply wells, and two EPA data bases, FRDS and STORET.

The state has mapped its aquifers through the U.S. Army Corps of Engineers East and West River Ground Water Studies. Ground water quality data was also collected through these studies and entered into a common data base.

Through the Oakwoods-Poinsett Rural Clean Water Program, the state began a ten-year ground water study of the effects of agricultural land use in 1982.

Finally, DWNR participates with governmental and private organizations in meetings and seminars on ground water problems, programs, and contamination potential.

STATE PESTICIDE CONTROL ACTIVITIES: UTAH

Utah has developed a ground water protection strategy, which is currently the subject of public meetings throughout the state. State agencies, the general public, and other interested parties are addressing a proposal for a ground water classification system and water quality standards. Two cooperative agreements have been assigned between the Department of Health and the U.S. Geological Survey.

Monitoring Program Review

Testing of samples from large water companies for pesticides has been done on a voluntary basis.

Regulatory Programs

At present, Utah has neither numeric nor narrative ground water quality standards but, as mentioned above, is considering a proposal to adopt them.

The state Department of Agriculture administers the pesticide labeling program and has pesticide misuse enforcement authority.

Other Activities

Utah has promoted public education on the hazards of using herbicides to kill weeds near irrigation canals.

STATE PESTICIDE CONTROL ACTIVITIES: WYOMING

In lieu of a formal ground water protection strategy, Wyoming has a permit-based program and a detailed program procedures manual that has been completed in draft form. Key elements of the program include a detailed ground water classification system, water quality standards, and permits to construct facilities which may affect ground water quality.

Monitoring Program Review

No data.

Regulatory Programs

Wyoming has both numeric and narrative ground water quality standards. At present, there are no numeric standards for pesticides. The narrative standards, which also outline the classification system, declare that underground water of classes I-III and "Special {A}" is not to contain biological, hazardous, toxic, or potentially toxic substances at levels which will impair the water's suitability for its defined use, that may contribute to a contravention of ground water quality standards, or that may have a hazardous effect on natural biota, given the latest available scientific information and the opinion of the Administrator of the Department of Environmental Quality. Class I ground water is suitable for domestic use, class II for agricultural use, class III for livestock, and class "Special {A}" for fish and aquatic life.

Other Activities

A proposal to develop a wellhead protection program was recently submitted to the state by the University of Wyoming.

Region IX

Arizona

California

Hawaii

Nevada

Arizona, Hawaii, and Nevada summaries were lost from a disc while printing. Prior to that, however, they had been sent via E-mail to Nancy Andrews of Region IX. She will mail paper copies of the summaries to OPP.

STATE PESTICIDE CONTROL ACTIVITIES: CALIFORNIA

California's ground water protection strategy was approved by EPA in February, 1988. The state is in the process of developing guidance for establishing beneficial uses and ground water quality standards. Nearly every aquifer in the state will be considered "high priority ground waters". California will use a differential approach to manage pesticide use by identifying areas of ground water vulnerability and regulating pesticide use in those areas to a greater degree. It will generally follow a nondegradation policy; a detectable level of a pesticide in ground water or in certain soil depths will be sufficient to trigger a regulatory response.

Monitoring Program Review

More than 50 pesticides have been found in ground water in 23 counties throughout the state. Four pesticides--DBCP, atrazine, 1,2-D, and simazine--were tested for in a sampling by the California Department of Health Services {DHS} of 2,947 wells which were all part of large public water systems. DBCP was found in 23% of the wells sampled; the other pesticides were also found, but in very few of the wells. EDB, alachlor, aldicarb, and carbofuran have also been detected in ground water.

The State Water Resources Control Board {SWRCB} conducts Priority I ground water basin monitoring, and site-specific sampling is done by SWRCB's nine regional boards. Once it is determined that a public water system is subject to potential contamination, the system is required to monitor for specific contaminants--including pesticides. The state Department of Food and Agriculture {DFA} also samples ground water for agricultural chemicals and collects monitoring data from all state agencies for publishing in an annual report.

Regulatory Programs

As already mentioned, California is in the process of developing numeric ground water quality standards. The discharge prohibition of Proposition 65 takes effect on November 1, 1988: no business with 10 or more employees may thereafter knowingly discharge a chemical listed by the state as causing cancer or reproductive toxicity into the land or water, if the chemical might pass into drinking water. Up to 14 of these chemicals are pesticides, most no longer used in the state. This law affects potentially 630 agricultural dischargers, primarily dairies and feedlots. The law's underlying philosophy is that any detectable amount of a listed chemical in drinking water is presumed to cause a health hazard; this can be rebutted only by scientific, health-based evidence without regard to such factors as economic and technological feasibility.

Proposition 65 also requires that persons in the course of doing business shall not knowingly and intentionally expose anyone to a chemical on the state list without first giving clear and reasonable warnings. This provision took effect on March 1, 1988. It does not apply for an exposure for which the person responsible can show poses "no significant risk" assuming a lifetime exposure level, for carcinogens, that results in one excess case of cancer in an exposed population of 100,000, nor for an exposure that will have "no observable effect" assuming exposure at 1,000 times the level in question for chemicals that adversely affect reproductivity. The state Health and Welfare Agency has the authority under the regulations to establish exposure levels that pose no significant risk.

The published list of chemicals known to cause cancer or reproductive toxicity must be updated each year. By January 1, 1989, the Governor must effect the publication of a separate list of chemicals that state experts have not found to be adequately tested for their potential to cause cancer or reproductive toxicity.

Civil and criminal sanctions under Proposition 65 may be imposed on persons who "knowingly" or "knowingly and intentionally" violate it. State agencies designated to implement the law are not required to adopt or modify regulations, standards, or permits in order to conform to it.

California's narrative standards, as they apply to pesticides, state that it is unlawful to deposit in, permit or pass into, or place where it can pass into the water or ground water any refuse, liquid or solid, from any chemical works, mill, or factory of any kind, or any substance or material deleterious to fish, birds, or plants.

The state Department of Food and Agricultur enforces the regulations pertaining specifically to pesticides. A pesticide applicator must describe any proposed use and otain a permit from a commissioner in the one of 291 separate districts having jurisdiction.

California will promote the identification of sensitive land areas where ground water vulnerability to pesticides is most likely and will regulate the use of pesticides in these areas to a greater degree. These areas--Pesticide Management Zones--will play a key role in the state pesticide management plan for achieving area-specific protection.

The Pesticide Contamination Prevention Act required more complete leaching-potential data on then-registered pesticides by December 1, 1986. Extensions may be granted through 1989. Further, the Act: requires DFA to produce a list of pesticides that exceed maximum values for movement through soil and persistence in soil; prohibits DFA from registering or reregistering any pesticide with a ground water protection data gap after December 1988 unless granted an exception; requires DFA to establish a list of pesticides with the potential to pollute ground water--the Ground Water Protection List, and; requires

DFA to monitor soil and ground water for pesticides on this list. In 1987, as its first decision under the Act, DFA banned the use of atrazine over 114 square miles in 16 counties.

Other Activities

California conducted a successful best management practices educational campaign for rice growers using the herbicides Bolero (thiobencarb) and Ordram (molinate) in the Sacramento area. The two main strategies were: (1) holding the irrigation water in the field for up to eight days to allow for greater degradation of the pesticides in the water; and (2) increasing efficiency by irrigating with recycled water. Bolero and Ordram are mainly surface water contaminants, however, and the effects of these practices on ground water have not been investigated.

The Santa Clara Valley Water District had initiated a program to identify and seal abandoned agricultural wells that may act as conduits for chemicals to reach ground water.

The state has developed a centralized ground water date storage and retrieval system, which includes information on pesticide usage in the state.

Region X

Alaska

Idaho

Oregon

Washington

STATE PESTICIDE CONTROL ACTIVITIES: ALASKA

Alaska's ground water protection strategy is in the early stages of development; completion is expected by the end of fiscal year 1988. The state has water quality standards for both surface and ground water.

Monitoring Program Review

All public drinking water supplies are tested at least once for the pesticides covered under the Safe Drinking Water Act.

Regulatory Programs

Alaska has numeric ground water quality standards, having adopted federal drinking water standards for 2,4-D, endrin, lindane, methoxychlor, toxaphene, and 2,4,5-TP silvex.

Other Activities

Alaska has shown interest in wellhead protection programs.

STATE PESTICIDE CONTROL ACTIVITIES: IDAHO

Idaho has had a ground water protection strategy since 1983, and is currently revising it to address inter-agency programs. On a priority ranking of potential sources of ground water contamination, pesticide use and handling ranks sixth.

The state is in the early stages of determining whether it has a problem with contamination of ground water by pesticides; it is developing a Geographic Information System data base, using soil and aquifer characteristics to map its most vulnerable ground water areas, and will use this information to help determine its monitoring priorities.

Monitoring Program Review

The state's ground water vulnerability mapping project will help define its monitoring needs. It has conducted limited sampling for pesticides in ground water through an ongoing series of time-specific site surveys. It is targeting sites most likely to be susceptible to contamination, based on pesticide use, ground water vulnerability (e.g., depth to ground water and soil characteristics), and recharge data. In four surveys conducted over the last two years the state has not detected any pesticides at levels that would cause concern for public health.

Regulatory Programs

Idaho does not have numeric ground water quality standards for pesticides at this time. Narrative standards--as they may apply to pesticides--state that water is not to contain hazardous materials in concentrations which adversely affect public health or designated or protected beneficial uses.

The state Department of Agriculture regulates the use of pesticides--including the enforcement of labeling requirements--while the Department of Health and Welfare has the authority to address contamination incidents.

Other Activities

The state has a public information/education program on the proper handling, transport, and disposal of pesticides.

Two years ago the state Department of Health and Welfare in cooperation with the state Cooperative Extension Service conducted a statewide survey of pesticide usage. This data was collected over a period of one year for pesticides identified by EPA as having the potential to leach to ground water. Data of this type helps the state to target sites for monitoring.

In the early stages of development of a nonpoint source management program, agriculture--and agricultural chemicals--is one of Idaho's major focuses. The state is working with an advisory committee to determine what its nonpoint management plan should be, and is interested in distinguishing--to the greatest extent possible--between contributions to pollution from nonpoint and point sources.

STATE PESTICIDE CONTROL ACTIVITIES: OREGON

Oregon is currently expanding its ground water protection policy and a comprehensive implementation strategy will be completed during fiscal year 1988. The state has proposed a three-tiered ground water classification system, and is working to include ground water quality standards as part of its strategy.

Monitoring Program Review

The Oregon Department of Agriculture (ODA) has conducted limited sampling for EDB and aldicarb. EPA Region 10 has also conducted limited testing in Ontario and the Willanette Valley for pesticides identified as having the potential to leach to ground water.

EDB and aldicarb have been found in ground water in trace amounts.

Regulatory Programs

At present, Oregon has neither numeric nor narrative ground water quality standards, however, as mentioned above, it is working on incorporating standards into its strategy.

Protection of both surface and ground water, as "waters of the state", is coordinated under the same general statute.

Other Activities

No data.

STATE PESTICIDE CONTROL ACTIVITIES: WASHINGTON

Washington has a final, approved ground water protection strategy. The goal of this strategy is to maintain high quality for all water, allowing no reduction in water quality, except in overriding considerations of public interest. No reduction that would adversely affect the ability to use water for its intended beneficial use is permitted. The state has proposed, but has not yet implemented, a three-tiered ground water classification system.

Monitoring Program Review

In 1984, the state took 131 samples from 96 wells in testing for the soil fumigant, EDB. The wells were located near areas of high EDB application--in western Washington primarily on strawberries and raspberries. Most samples were taken from private wells; a few small public systems were sampled as well. Initially, 28% of the sites tested positive. This dropped to 15% following resampling.

Regulatory Programs

Washington has narrative ground water quality standards, which is equivalent to the goal of its ground water protection strategy as stated above.

Washington has a law which requires the establishment of local ground water management areas {15 thus far}, a law that requires consideration of ground water protection in land use planning updates, and legislation which allows local districts to levy local taxes to fund ground water protection activities {already adopted in the Spokane area}. The state has two laws relating specifically to pesticides: the Washington Pesticide Control Act and the Washington Pesticide Application Act. The two laws give the state the authority to regulate the handling, transportation, storage, distribution, and use of pesticides.

The state Department of Agriculture has the authority to ban or place restrictions on pesticides. It prefers geographic bans and use restrictions to outright bans. 2,4-D is banned throughout the state while certain other pesticides are banned within the Spokane aquifer.

All pesticides used in the state must be registered with the Department of Agriculture. An annual fee of $20 is charged for each pesticide registered. All pesticide dealers must pass a written examination and obtain a license. Commercial pesticide applicators must be certified and licensed. Private applicators also have to be certified in order to use certain state restricted use pesticides.

Additional regulations include requirements to: take care in mixing and loading pesticides near public water supplies; use devices or procedures to prevent back-syphoning; handle, apply, or dispose of pesticides in a way that minimizes harm to commercially valuable pollinating insects; refrain from applying pesticides under conditions that may result in contamination of schools, hospitals, nursing homes, etc.; avoid applying pesticides if weather conditions are such that drift may harm humans, desirable plants and animals, or adjacent land; properly maintain and dispose of empty pesticide containers {e.g., triple-rinsing}; and, in general, refrain from transporting, handling, storing, loading, applying, and disposing of any pesticide, pesticide container or apparatus in such a manner as to pollute water supplies or waterways, or cause damage or injury to land, humans, desirable plants and animals, or wildlife.

The Department of Agriculture has misuse investigation and enforcement authority, including stop sale, use, or removal orders, denial and revocation of licenses, registrations, and permits, and issuance of subpoenas. The maximum penalty upon conviction is a fine of $1,000 for each violation.

Commercial applicators, and private applicators of certain restricted use pesticides, may be required to keep pesticide use records.

The Pesticide Advisory Board, whose members are appointed by the Governor, advises the Director of the Department of Agriculture on any or all problems related to the use and application of pesticides in the state.

Other Activities

Memoranda of Understanding and Agreements are being developed to support interagency implementation of the ground water protection strategy.

Washington State University is doing research on Integrated Pest Management.

The state is interested in establishing local wellhead protection pilot projects.